APPENDIX C ANALYTICAL DATA





1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6 Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID: EQM100

ALS WO#: L1830765 Date of Report 24-Oct-16

Date of Sample Receipt 19-Sep-16

Client Name:

Environmental Quality Management Inc.

Client Address:

1800 Carillon Boulevard

Cincinnati, OH 45240

United States

Client Contact:

Doug Allen

Client Project ID: 050074.0172 AK MIDDLETOWN

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 315 (SA 21-Oct-2016)

Sample processing was completed with toluene in place of methylene chloride, as per client request.

After the acetone rinse fractions were blown down and weights taken, front half toluene fractions were combined with acetone rinse residues to allow for MCEM analysis. These results are reported under the acetone sample headers, but pertain to the combined fractions.

During sample processing, Fractions 3S and 3W were inadvertently combined, and extracted together. A single 3W + 3S MCEM value is reported for this combined solution, instead of two separate values.

All solutions were weighed before, and after processing to provide total solution masses. These are not explicitly required in the method, but are included for completion.

P. Elder 21-Oct-16

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank

CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)

LOR = Limit of Reporting

Certified by:

Whitney Davis
Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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Sample Name		C-315-1 FILTER	C-315-1 FRONT 1/2 ACETONE	C-315-1 FRONT 1/2 TOLUENE	C-315-1 ACETONE/ TOLUENE	C-315-1 BACK 1/2 H2C
ALS Sample ID		L1830765-1	L1830765-2	L1830765-3	L1830765-4	L1830765-5
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		12-Sep-16	12-Sep-16	12-Sep-16	12-Sep-16	12-Sep-1€
Date of Receipt		19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16
PM via Gravimetric Analysis	LOR					
Method 315	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	37.1	-	-	-	-
Filter MCEM Particulate Matter	0.4	0.3 J	=	-	-	-
Acetone Particulate Matter	0.4		40.7	-	-	-
Acetone + Toluene MCEM Particulate Matter	0.4	-	5.1	-	-	-
3W + 3S MCEM Particulate Matter	0.4	-	-	-	2.1	-
Sample Masses						
•	g	g	g	g	g	g
Acetone Rinse Mass	0.02	-	25.2	-	-	-
Toluene Rinse Mass	0.02	-	-	20.1	-	-
Acetone/Toluene Mass	0.02	-	-	-	111	-
Water Impinger Mass	0.02	-	-	-	-	459

A CONTROL OF THE CONT			C-315-2 FRONT	C-315-2 FRONT	C-315-2 ACETONE/	C-315-2 BACK 1/2
Sample Name		C-315-2 FILTER	1/2 ACETONE	1/2 TOLUENE	TOLUENE	H20
ALS Sample ID		L1830765-6	L1830765-7	L1830765-8	L1830765-9	L1830765-10
Matrix		Stack	Stack	Stack	Stack	Stac
Analysis type		Sample	Sample	Sample	Sample	Sampi
Sampling Date/Time		13-Sep-16	13-Sep-16	13-Sep-16	13-Sep-16	13-Sep-1
Date of Receipt		19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-1
PM via Gravimetric Analysis	LOR					
Method 315	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	8.0	9,2	-	-	-	-
Filter MCEM Particulate Matter	0.4	<	-	-	-	
Acetone Particulate Matter	0.4	=	51.1	-	-	-
Acetone + Toluene MCEM Particulate Matter	0.4	-	14.0	-	-	
3W + 3S MCEM Particulate Matter	0.4	-	-	•	1.5	-
Sample Masses						
-	g	g	g	g	g	g
Acetone Rinse Mass	0,02	-	63.2	-	-	-
Toluene Rinse Mass	0.02	-	-	49.9	-	-
Water Mass	0.02	-	-	-	86.3	-
Water Impinger Mass	0,02	_	_	-	-	446

Sample Name		C-315-3 FILTER	C-315-3 FRONT 1/2 ACETONE	C-315-3 FRONT 1/2 TOLUENE	C-315-3 ACETONE/ TOLUENE	C-315-3 BACK 1/2 H2C
ALS Sample ID		L1830765-11	L1830765-12	L1830765-13	L1830765-14	L1830765-15
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		14-Sep-16	14-Sep-16	14-Sep-16	14-Sep-16	14-Sep-16
Date of Receipt		19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16
PM via Gravimetric Analysis	LOR		11.44.4			
Method 315	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	8.0	49,3	-	-	-	-
Filter MCEM Particulate Matter	0.4	<	-	-	-	-
Acetone Particulate Matter	0.4	-	77.3	-	-	-
Acetone + Toluene MCEM Particulate Matter	0.4	-	33.1	-	-	-
3W + 3S MCEM Particulate Matter	0.4	-	-	-	3.2	-
Sample Masses						
•	g	g	g	g	g	g
Acetone Rinse Mass	0.02	u u	52.5		**	
Toluene Rinse Mass	0.02	-	-	109	-	-
Water Mass	0.02	-	-	-	129	-
Water Impinger Mass	0.02	_	.	-		439

Sample Name		P-315-1 FILTER	P-315-1 FRONT 1/2 ACETONE	P-315-1 FRONT 1/2 TOLUENE	P-315-1 ACETONE/ TOLUENE	P-315-1 BACK 1/2 H2O
ALS Sample ID		L1830765-16	L1830765-17	L1830765-18	L1830765-19	L1830765-20
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		13-Sep-16	13-Sep-16	13-Sep-16	13-Sep-16	13-Sep-16
Date of Receipt		19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16
PM via Gravimetric Analysis	LOR					
Method 315	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	<	-	-	-	-
Filter MCEM Particulate Matter	0.4	<	-	-	-	-
Acetone Particulate Matter	0.4	-	2.1	u u	-	-
Acetone + Toluene MCEM Particulate Matter	0.4	=	4.0	-	-	-
3W + 3S MCEM Particulate Matter	0.4		-	-	10.5	-
Sample Masses						
·	g	g	g	g	g	g
Acetone Rinse Mass	0.02	-	68.1	-	-	-
Toluene Rinse Mass	0.02	-	-	51.7	-	-
Water Mass	0.02	_	-	-	133	-
Water Impinger Mass	0.02	-	-	-	_	274

Sample Name		P-315-2 FILTER	P-315-2 FRONT 1/2 ACETONE	P-315-2 FRONT 1/2 TOLUENE	P-315-2 ACETONE/ TOLUENE	P-315-2 BACK 1/2
ALS Sample ID		L1830765-21	L1830765-22	L1830765-23	L1830765-24	L1830765-2
Matrix		Stack	Stack	Stack	Stack	Stac
Analysis type		Sample	Sample	Sample	Sample	Sampl
Sampling Date/Time		14-Sep-16	14-Sep-16	14-Sep-16	14-Sep-16	14-Sep-1
Date of Receipt		19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-1
PM via Gravimetric Analysis	LOR					
Method 315	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	ل 3,0	-	-	-	-
Filter MCEM Particulate Matter	0.4	<	-	-	-	-
Acetone Particulate Matter	0.4	-	2.5	_		-
Acetone + Toluene MCEM Particulate Matter	0.4	-	10,9	-	-	-
3W + 3S MCEM Particulate Matter	0.4	-	-	-	24.8	-
Sample Masses						
·	g	g	g	g	g	g
Acetone Rinse Mass	0,02	-	80.7		-	-
Toluene Rinse Mass	0.02	-	-	98,6	-	-
Water Mass	0.02	-	-	-	139	-
Water Impinger Mass	0.02		•		-	306

Sample Name		P-315-3 FILTER	P-315-3 FRONT 1/2 ACETONE	P-315-3 FRONT 1/2 TOLUENE	P-315-3 ACETONE/ TOLUENE	P-315-3 BACK 1/2 H2O
ALS Sample ID		L1830765-26	L1830765-27	L1830765-28	L1830765-29	L1830765-30
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		15-Sep-16	15-Sep-16	15-Sep-16	15-Sep-16	15-Sep-16
Date of Receipt		19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16
PM via Gravimetric Analysis	LOR					
Method 315	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	8.0	<	M		i u	-
Filter MCEM Particulate Matter	0.4	<	-	-	-	-
Acetone Particulate Matter	0.4	-	2.4	-	-	-
Acetone + Toluene MCEM Particulate Matter	0.4	-	94	•	•	-
3W + 3S MCEM Particulate Matter	0.4	-	-	-	3.4	-
Sample Masses						
-	g	g	g	g	g	g
Acetone Rinse Mass	0.02	-	86.9	-	-	-
Toluene Rinse Mass	0.02	-	-	68.3	-	-
Water Mass	0.02	-	-	-	76.4	-
Water Impinger Mass	0.02	-	-	-	-	266

Sample Name		BLANK - FILTER	BLANK - FRONT 1/2 ACETONE	BLANK - FRONT 1/2 TOLUENE	BLANK - ACETONE/ TOLUENE	BLANK - BACK 1/2 H2O
ALS Sample ID		L1830765-31	L1830765-32	L1830765-33	L1830765-34	L1830765-35
Matrix		Stack	Stack	Stack	Stack	Stack
Analysis type		Sample	Sample	Sample	Sample	Sample
Sampling Date/Time		15-Sep-16	15-Sep-16	15-Sep-16	15-Sep-16	15-Sep-16
Date of Receipt		19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16	19-Sep-16
PM via Gravimetric Analysis	LOR					
Method 315	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	<	-	-	-	-
Filter MCEM Particulate Matter	0.4	<	-	-	-	-
Acetone Particulate Matter	0.4	-	2.4	•	₩.	-
Acetone + Toluene MCEM Particulate Matter	0.4	-	1.9	-	-	-
3W + 3S MCEM Particulate Matter	0.4	-	-	-	<	-
Sample Masses						
·	g	g	g	g	g	g
Acetone Rinse Mass	0.02	-	82.8	-	-	-
Toluene Rinse Mass	0.02	-	-	30.9	-	-
Water Mass	0.02	-	-	-	91.9	-
Water Impinger Mass	0.02	-	-	-	-	107

Sample Name		L	СВ	
ALS Sample ID		L1830765-L	СВ	
Matrix			n/a	
Analysis type		Sam	ple	
Sampling Date/Time			n/a	
Date of Receipt		I	n/a	
PM via Gravimetric Analysis	LOR			
Method 315	mg	mg		
Filter Particulate Matter	8.0	-		
Filter MCEM Particulate Matter	0.4	-		
Acetone Particulate Matter	0.4	0.2	J	
Acetone + Toluene MCEM Particulate Matter	0.4	-		
3W + 3S MCEM Particulate Matter	0.4	-		
Sample Masses				
	g	g		
Acetone Rinse Mass	0.02	29.4		
Toluene Rinse Mass	0.02	-		
Water Mass	0,02	29.4		
Water Impinger Mass	0.02	-		
Tracer imparger mass				





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Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID: EQM100

ALS WO#: L1826946 Date of Report 19-Sep-16

Date of Sample Receipt 9-Sep-16

Client Name:

Environmental Quality Management Inc.

Client Address:

1800 Carillon Boulevard

Cincinnati, OH 45240

United States

Client Contact:

Doug Allen

Client Project ID: 50074.0172 AK STEEL ICR

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 5 (PE 19-Sep-16)

REPORT FLAGS:

J - The value is uncertain and below what can be reliably identified as positive with a ≥99% confidence limit (i.e. below the laboratory determined MDL).

LCB = Laboratory Control Blank

CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)

LOR = Limit of Reporting

Certified by:

Rachael Stolys Account Manager

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Sample Name		P-5/29-1	P-5/29-2	P-5/29-3	C-5/29-1	C-5/29-2
LS Sample ID		L1826946-1	L1826946-2	L1826946-3	L1826946-4	L1826946-
Matrix		Stack	Stack	Stack	Stack	Stac
nalysis type		Sample	Sample	Sample	Sample	Sampl
Sampling Date/Time		29-Aug-16	31-Aug-16	6-Sep-16	6-Sep-16	7-Sep-1
Date of Receipt		9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-1
PM via Gravimetric Analysis	LOR					
Method 5	mg	mg	mg	mg	mg	mg
Filter Particulate Matter	0.8	1.0	1.5	0.9	178	93.8
Acetone Particulate Matter	0.4	1.8	2.7	1.9	130	80.5
	g	g	g	g	g	g
Acetone Mass	0.02	37.1	81.6	59,9	18,3	27.0

imple Name		C-5/29-3	5/29-BLANK	LC
LS Sample ID		L1826946-6	L1826946-7	L1826946-LC
Matrix		Stack	Stack	n
Analysis type		Sample	Sample	Samp
Sampling Date/Time		7-Sep-16	8-Sep-16	n
Date of Receipt		9-Sep-16	9-Sep-16	n
PM via Gravimetric Analysis	LOR	······		
Method 5	mg	mg	mg	mg
Filter Particulate Matter	8,0	159	0.4 J	-
Acetone Particulate Matter	0.4	77.6	<	0,1
	g	g	g	g
Acetone Mass	0.02	30.8	46,0	30,8



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Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID: EQM100

ALS WO#: L1826946

Date of Report 29-Sep-16

Date of Sample Receipt 9-Sep-16

Client Name:

Environmental Quality Management Inc.

Client Address:

1800 Carillon Boulevard

Cincinnati, OH 45240

United States

Client Contact: Doug Allen

Client Project ID: 50074.0172 AK Steel ICR

COMMENTS:

Mercury Analysis via CVAA using Method USEPA 7470A (NOB 2016-09-27)

The Laboratory Control Sample Duplicate (LCSD) recovery in fraction 1B (89%) is just below the method control limit. The LCS recovery is within limits. This is not expected to significantly impact data quality.

The LCS and LCSD recoveries in fraction 3B (87%, 88%) are just below the method control limit. The MS and MSD are within the method control limits. This is not expected to have a significant impact on data quality.

LOR = Limit of Reporting

LCB = Laboratory Control Blank (limits: <LOR)

LCS = Laboratory Control Sample (limits: solids: 85-115%, stack: 90-110%)

MS = Matrix Spike Sample (limits: 75-125%) RPD = Relative Percent Difference (limits: <20%)

CCV/CVS = Calibration Verification Standard (limits: 85-115%)

Certified by:

Whitney Davis Account Manager

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Page 1 of 5 L1826946 HG 160929 ALS Canada Ltd

Sample Name		P-5/29-1	P-5/29-2	P-5/29-3	C~5/29-1	C-5/29-
Sample Hante		1 -0,20-1				
ALS Sample ID		L1826946-1	L1826946-2	L1826946-3	L1826946-4	L1826946-
Matrix		Stack	Stack	Stack	Stack	Stac
Analysis type		Sample	Sample	Sample	Sample	Sampl
Sampling Date/Time		29-Aug-16	31-Aug-16	6-Sep-16	6-Sep-16	7-Sep-1
Date of Receipt		9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-1
Mercury via FIMS CVAA	LOR					
Method 29	ug	ug	ug	ug	ug	ug
Analytical Fraction 1B	0.015	<	<	<	<	<
	O OFO	<	<	<	0,440	0.210
Analytical Fraction 2B	0.050					
Analytical Fraction 2B Analytical Fraction 3A		<	<	<	<	<
•	0.005		< <	< <		< <

Sample Name		C-5/29-3	5/29-BLANK	
ALS Sample ID		L1826946-6	L1826946-7	
Matrix		Stack	Stack	
Analysis type		Sample	Sample	
Sampling Date/Time		7-Sep-16	8-Sep-16	
Date of Receipt		9-Sep-16	9-Sep-16	
Mercury via FIMS CVAA	LOR			
Method 29	ug	ug	ug	
metrou zo	49	ug.	-5	
Analytical Fraction 1B	0.015	<	<	
Analytical Fraction 2B	0.050	0.490	0.216	
Analytical Fraction 3A	0.005	<	<	
Analytical Fraction 3B	0.025	<	<	
Analytical Fraction 3C				

Sample QC Summary Report

Sample Name		LCB	LCS	LCS	LCSD	LCSE
ALS Sample ID		LCB	LCS	LCS	LCSD	LCSI
Analysis type		Method Blank	Blank Spike	Blank Spike	Blank Spike Dup	Blank Spike Duj
Sampling Date/Time		N/A	N/A	N/A	N/A	N//
Date of Receipt		N/A	N/A	N/A	N/A	N/A
Mercury via FIMS CVAA	LOR		•			,
Method 29	ug	ug	ug	% Rec	ug	% Rec
	-	- u	ч	/a INCC	ag	701100
Analytical Fraction 18	-	<	0,275	94%	0.262	89%
Analytical Fraction 18 Analytical Fraction 2B	0.02	-			_	
,	0.02 0.050	<	0.275	94%	0.262	89%
Analytical Fraction 2B	0.02 0.050 0.01	< <	0.275 0.892	94% 91%	0.262 0.897	89% 92%

Sample QC Summary Report

Sample Name		P-5/29-1	P-5/29-1	P-5/29-1	P-5/29-1	P-5/29-1	P-5/29-
ALS Sample ID		L1826946-1	L1826946-1DUP	L1826946-1MS	L1826946-1MS	L1826946-1MSD	L1826946-1MS
Matrix		Stack	Stack	Stack	Stack	Stack	Stac
Analysis type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	Matrix Spike Du
Sampling Date/Time		29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29~Aug-1
Date of Receipt		9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-1
Mercury via FIMS CVAA	LOR						
Method 29	иg	ug	ug	ug	% Rec	ug	% Rec
Analytical Fraction 1B	0,015	<	<	0.287	97%	0,288	98%
Analytical Fraction 2B	0.050	<	<	2.76	84%	2.78	84%
	0.005	<	<	0.204	99%	0.198	96%
Analytical Fraction 3A							
Analytical Fraction 3A Analytical Fraction 3B		<	<	0,458	92%	0.452	90%



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Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID: EQM100 ALS WO#: L1826946

Date of Report 29-Sep-16

Date of Sample Receipt 9-Sep-16

Client Name: Environmental Quality Management Inc.

Client Address: 1800 Carillon Boulevard

Cincinnati, OH 45240

United States

Client Contact: Doug Allen

Client Project ID: 50074.0172 AK Steel ICR

COMMENTS:

Metals analysed via ICP-MS Method USEPA 6020A (MC 22-Sep-16) Sample Preparation via USEPA Method 29 (NOB 22-Sep-16)

Fraction 1A Analysis

Antimony was detected in the Laboratory Control Blank. Data may be biased high.

Fraction 2A Analysis

The Laboratory Control Sample was not spiked and the Laboratory Control Sample Duplicate was double-spiked. There is no expected impact on data quality.

LCB = Laboratory Control Blank

LCS = Laboratory Control Sample

LCSD = Laboratory Control Sample Duplicate

LOR = Limit of Reporting

Certified by:

Whitney Davis Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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		ALS Env	rironmen	ıtal			
Sample Analysis Summary Report							
Sample Name		P-5/29-1	P-5/29-2	P-5/29-3	C-5/29-1	C-5/29-2	C-5/29-3
ALS Sample ID		L1826946-1	L1826946-2	L1826946-3	L1826946-4	L1826946-5	L1826946-6
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Sample	Sample	Sample	Sample	Sample
Sampling Date		29-Aug-16	31-Aug-16	6-Sep-16	6-Sep-16	7-Sep-16	7-Sep-16
Date of Receipt		9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16
Multi-Metals via ICP-MS	LOR						
	ug	ug	ug	ug	ug	ug	ug
Front Half HF Fraction 1A							
Antimony	0.2	1.07	<	<	<	<	0.230
Arsenic	1	<	<	<	6.22	7.00	8.42
Beryllium	0.2	<	<	<	<	<	<
Cadmium	0.1	<	<	<	0.100	0.102	0.109
Chromium	1	4,28	2.90	3.06	9.30	13.5	9.87
Cobalt	0.2	<	<	<	<	<	<
Lead	0.5	0.714	0.814	0.677	10.2	6.95	12.4
Manganese	0.5	5.68	5.32	6.24	12.0	10.2	5.03
Nickel	0.2	3.24	3.74	3.07	8.25	12.8	5.78
Seienium	2	<	<	<	<	<	<
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	<	<	1.67	<
Arsenic	0.2	<	<	<	0.940	0.772	1.09
Beryllium	0.1	<	<	<	<	<	<
Cadmium	0.05	<	<	<	<	<	<
Chromium	0.15	17.3	13.6	7.76	10.7	5.98	9.61
Cobalt	0.1	0.307	0.170	0.100	0.221	0.135	0.229
Lead	0.05	0.501	0.311	0.407	0.328	0.454	0.42
Manganese	0.15	6.99	3.00	2.64	2.80	4.22	2.52
Nickel	0.1	18.7	10.4	6.83	11.6	5.76	7.15
Selenium	1	<	<	<	17.0	11.8	12.7

ALS Environmental					
Sample Analysis Summary Report					
Sample Name		5/29-BLANK			
ALS Sample ID		L1826946-7			
Matrix		Stack			
Analysis Type		Sample			
Sampling Date		8-Sep-16			
Date of Receipt		9-Sep-16			
Multi-Metals via ICP-MS	LOR				
	ug	ug			
Front Half HF Fraction 1A					
Antimony	0.2	0.285			
Arsenic	1	<			
Beryllium	0.2	<			
Cadmium	0.1	<			
Chromium	1	<			
Cobalt	0.2	<			
Lead	0.5	<			
Manganese	0.5	1.12			
Nickel	0.2	1.97			
Selenium	2	<			
Back Half (HNO3 / H2O2) Fraction 2A					
Antimony	0.1	<			
Arsenic	0.2	<			
Beryllium	0.1	<			
Cadmium	0.05	<			
Chromium	0.15	0.760			
Cobalt	0.1	<			
Lead	0.05	0.0650			
Manganese	0.15	0.689			
Nickel	0.1	1.03			
Selenium	1	<			

	Α	LS Envir	onment	al			
Sample QC Summary Report							
Sample Name		LCB	LCS	LCS	LCSD	LCSD	
ALS Sample ID		LCB	LCS	LCS	LCSD	LCSD	
Matrix		Stack	Stack	Stack	Stack	Stack	
Analysis Type		Blank	LCS	LCS	LCS	LCS	
Sampling Date		n/a	n/a	n/a	n/a	n/a	
Date of Receipt		n/a	n/a	n/a	n/a	n/a	
Muiti-Metals via ICP-MS	LOR						
	ug	ug	ug	% Rec	ug	% Rec	
Front Half HF Fraction 1A							
Antimony	0.2	1.22	11.8	88	11.6	87	
Arsenic	1	<	56.2	93	57.1	95	
Beryllium	0.2	<	59.8	100	60.1	100	
Cadmium	0.1	<	28.5	95	28.8	96	
Chromlum	1	<	56.7	94	57.4	96	
Cobalt	0.2	<	57.1	95	56.8	95	
Lead	0.5	<	59.3	99	59.5	99	
Manganese	0.5	<	56.2	94	56.3	94	
Nickel	0.2	<	56.8	95	56.9	95	
Selenium	2	<	57.4	95	58.6	97	
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	n/a	n/a	5.56	93	
Arsenic	0.2	<	n/a	n/a	57.1	95	
Beryllium	0.1	<	n/a	n/a	59.6	99	
Cadmium	0.05	<	n/a	n/a	28.5	95	
Chromium	0.15	<	n/a	n/a	58.8	98	
Cobalt	0.1	<	n/a	n/a	58.5	98	
Lead	0.05	<	n/a	n/a	61.2	102	
Manganese	0.15	<	n/a	n/a	57.5	96	
Nickel	0.1	<	n/a	n/a	58.0	97	
Selenium	1	<	n/a	n/a	56.2	94	

ALS Environmental Sample QC Summary Report							
Sample Name		P-5/29-1	P-5/29-1	P-5/29-1	P-5/29-1	P-5/29-1	P-5/29-1
ALS Sample ID		L1826946-1	L1826946-1	MS	MS	MSD	MSD
Matrix		Stack	Stack	Stack	Stack	Stack	Stack
Analysis Type		Sample	Duplicate	Matrix Spike	Matrix Spike	Matrix Spike Dup	
Sampling Date		29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16	29-Aug-16
Date of Receipt		9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16
Multi-Metals via ICP-MS	LOR						
	ug	ug	ug	ug	% Rec	ug	% Rec
Front Half HF Fraction 1A							
Antimony	0.2	1.07	0.427	21.8	86	22.3	88
Arsenic	1	1.07	0.427 <	105	87	110	91
Beryllium	0.2	<	<	109	91	112	93
Cadmium	0.1	<	<	51.9	86	54.4	9:
Chromium	1	4,28	4.52	118	95	126	10:
Cobalt	0,2	<	<	111	93	116	9
Lead	0.5	0,714	0.712	119	99	120	100
Manganese	0.5	5.68	5.78	119	95	127	10:
Nickel	0.2	3.24	3.19	113	92	117	9.
Selenium	2	<	<	105	88	110	92
Back Half (HNO3 / H2O2) Fraction 2A							
Antimony	0.1	<	<	11.9	99	10.9	9:
Arsenic	0.2	<	<	57.1	95	52.3	8
Beryllium	0.1	<	<	56.6	94	52.9	8
Cadmium	0.05	<	<	30.6	102	28.0	9
Chromium	0.15	17.3	18.5	84.0	111	74.4	9
Cobalt	0.1	0.307	0.317	64.5	. 107	57.8	9
Lead	0.05	0.501	0.520	60.5	100	55.1	9
Manganese	0.15	6.99	5.76	70.9	106	63.5	9
Nickel	0.1	18.7	19.6	83.4	108	75.0	9
Selenium	1	<	<	55.8	92	50.9	8



PROJECT ANALYTICAL SHEET (sheet 1 of 1)

Project Na	Project Name: AK Middletown ICR			Project No.: <u>050074.0172</u>			
Project Dat	te(s):		Project Manager:Allen				
Method(s):	2	01A, 202	No. of Sites:	2			
RUN NO.	ID NO.	DESCRIPTION/#	TARE MASS	FINAL MASS	NET MASS		
KUN NO.							
P-202-1	2016-262	Filter 832610	345.75	346.35	0.6		
P-202-1	2016-263	Acetone 456	133,306.85	133,308.3	1.45		
P-202-2	2016-264	Filter 832594	355.0	353.0	0.0		
P-202-2	2016-265	Acetone 457	130,398.85	130, 400.7	1.85		
P-202-3	2016-266	Filter 832587	344.15	344,45	0.3		
P-202-3	2016-267	Acetone 458	133,408.95	133,411.8	2.8.5		
C-PM10-1	2016-268	Filter 470923	112.05	201.0	88.95		
C-PM10-1	2016-269	PM>10 459	133,038.65	133,041.95	3.3		
C-PM10-1	2016-270	2.5 <pm<10 460<="" td=""><td>134,058.75</td><td>134,065,7</td><td>6.95</td></pm<10>	134,058.75	134,065,7	6.95		
C-PM10-1	2016-271	PM<2.5 461	134,757.75	134,759.4	1.65		
C-PM10-2	2016-272	Filter 470920	112.25	176:65	64.4		
C-PM10-2	2016-273	PM>10 462	128,123.85	128, 130,1	6.25		
C-PM10-2	2016-274	2.5 <pm<10 463<="" td=""><td>136,715.10</td><td>134,722-85</td><td>7.75</td></pm<10>	136,715.10	134,722-85	7.75		
C-PM10-2	2016-275	PM<2.5 464	133,982.25	133,982.9	0.65		
C-PM10-3	2016-276	Filter 470922	112.0	163.75	57.75		
C-PM10-3	2016-277	PM>10 465	132,864.30	132,873.0	8.7		
C-PM10-3	2016-278	2.5 <pm<10 466<="" td=""><td>128,362.60</td><td>128, 364.3</td><td>6.7</td></pm<10>	128,362.60	128, 364.3	6.7		
C-PM10-3	2016-279	PM<2.5 467	139,333.15	139, 336, 75	3.6		
BLANK	2016-280	Filter 832568	337.95	345.5	7.55		
BLANK	2016-281	Acetone 468	131,214.25	131,214.35	0.1		
BLANK	2016-282	Filter 470921	112.15	112.15	0.0		
	ž	***					

Site: AK Middletarn ICI	
Filter No.: 832610	I.D. No.: 2016-262
Final Mass:	Tare Mass: 345,75
Date/Time	<u>Name</u> <u>Mass</u>
#1 10/6/16 16:37	EZ 3463
#2 10/7/16 0650	BF 346.4
#3	
#4	N =
	Avg. Mass:346,35 Net Gain:0.6
Comments:	
F/H Beaker No.:456	a company
Final Mass:	Tare Mass:
Date/Time	<u>Name</u> <u>Mass</u>
#1 10/6/16 16:52	EZ 133,308.4
#2 10/7/16 0650	GF 133, 308. Q
#3	
#4	
	Avg. Mass:
Comments:	
B/H Beaker No.:	I.D. No.:
Final Mass:	Tare Mass:
<u>Date/Time</u>	<u>Mass</u>
#1	-
#2	
#3	
#4	
	Avg. Mass:
Comments:	Net Gain:

Site: AK Middletan	ICR Run No.:	P-202-2
Filter No.: 832594	I.D. No.:	2016-264
Final Mass:	Tare Mass	:355.0
Date/Time	<u>Name</u>	Mass
		355.9
#2 10/7/16 0657	<u>GF</u>	35 9.0
#3		
#4		
~ .		vg. Mass:355,0
Comments:		et Gain:
F/H Beaker No.: 457		2016-265
Final Mass:	Tare Mass	:130,398.85
Date/Time	Name	Mass
#1 10/6/16 16:53	EZ_	130,400.8
#2 10/7/16 0651	BF	130, 400, 6
#3		
#4		
		et Gain: 130, 400.7
B/H Beaker No.:		
Final Mass:	Tare Mas	s:
Date/Time	Name	<u>Mass</u>
#1		S
#2		
#3		
#4		2
	Av	vg. Mass:
Comments:	N	et Gain:

Site: AK Middletarn Ic	
Filter No.: 832587	I.D. No.: 3 2016-266
Final Mass:	Tare Mass:344.15
Date/Time	<u>Name</u> <u>Mass</u>
	EZ 344.3
#2 10/7/16 0652 _	BF 344,6
#3	
#4	
C	Avg. Mass: 344, 45 Net Gain: 0.3
Comments: F/H Beaker No.: 458	
Final Mass:	Tare Mass:133, 408. 95
<u>Date/Time</u>	<u>Mass</u>
#1 1916/16 16:55	EZ 133,412.0
#2 10/7/16 0652	BF 133, 411. 6
#3	
#4	
	Avg. Mass:
Comments:	
B/H Beaker No.:	
Final Mass:	Tare Mass:
Date/Time	<u>Name</u> <u>Mass</u>
#1	
#2	
#3	
#4	
	Avg. Mass:
Comments:	Net Gain:

Site: AK Middletown Ic	Run No.:	C-PMO-1
Filter No.: 470923		2016-268
Final Mass:	Tare Mas	ss: 112,05
Date/Time	Name	<u>Mass</u>
#1 _10/6/16 16:47 _	EZ	201.0
#2 10/7/16 0653	βF	2010
#3		<u> </u>
#4		
	A	Avg. Mass:
Comments: PM>10 Beaker No.: 459		2016-269
Final Mass:		ss: 133,038.65
	Name Name	Mass
Date/Time		133,042,2
#1 _ 1-70/10 (0.70	se.	133,041.7
#3		
		-
#4		Avg. Mass: 133,041.95
Comments:	×0.000 8	Avg. Mass:
2.5 <pm<10 beaker="" no.:<="" td=""><td>I.D. No</td><td>.:2016-270</td></pm<10>	I.D. No	.:2016-270
Final Mass:	Tare M	ass: 134,058.75
<u>Date/Time</u>	<u>Name</u>	Mass
#1 _ 10/6/16 16:56	E2	134,065.9
#2 10/7/16 0654	OF	134, 065, 5
#3		
#4		
Comments:	â	Avg. Mass: 134, 065. 7 Net Gain: 6.95

Site: AK Middletown ICR	Run No.: _	C-R410-1
PM<2.5 Beaker No.: 461	I.D. No.:	2016-271
Final Mass:	Tare Mass:	134,757.75
<u>Date/Time</u>	<u>Name</u>	Mass
#1 10/6/16 16:57	EZ	134, 759,5
#2 10/7/16 0654	3,=	134, 759, 3
#3		
#4		
		g. Mass:
Comments:		t Gain:
B/H Beaker No.:		
Final Mass:	Tare Mass:	
<u>Date/Time</u>	Name	Mass
#1		
#2		
#3		
#4		
		g. Mass:
Comments:		t Gain:
B/H Beaker No.:	I.D. No.: _	
Final Mass:	Tare Mass	:
<u>Date/Time</u>	<u>Name</u>	Mass
#1	 : ;	
#2		
#3		
#4	45 	
		g. Mass:
Comments:	Ne	t Gain:

Site: AK Middletown ICR	Ru	n No.:	-Pu10-2	
Filter No.: <u>470920</u>	_ I.D). No.:	2016-272	
Final Mass:	Tai	re Mass:	112,25	
<u>Date/Time</u>	<u>Name</u>		<u>N</u>	<u>lass</u>
#1 10/6/16 16:43	E2		176.9	
#2 10/7/16 0653-	BF		+76. 4 B	DF 176.4
#3				······································
#4				
Comments:				54, 4
PM>10 Beaker No.: 462	I.D		W	
Final Mass:	Tai	re Mass:	128, 123	.25
Date/Time	<u>Name</u>		<u>N</u>	<u>Iass</u>
#1 10/6/16 16:57	EZ		128,13	2,3
#2 10/7/16 0655	31=		128, 12	9,9
#3				
#4		- 1		
Comments:		Avg. M Net Ga	ass: <i>12</i>	6-25
2.5 <pm<10 beaker="" no.:<="" td=""><td>I.]</td><td></td><td>016-274</td><td></td></pm<10>	I.]		016-274	
Final Mass:	Ta	are Mass:	136,71	5.10
<u>Date/Time</u>	Name		<u>N</u>	<u>Mass</u>
#1 10/6/16 16:58	EZ		136,723	,0
#2 10/7/16 0656	131=		136, 72	2.7
#3				
#4				
			ass:	722.85
Comments:		Net Ga	ın:	1. 13

Site: AK uddleton ICR		Run No.: _	C-PM10-2
PM<2.5 Beaker No.:464		I.D. No.:	2016-275
Final Mass:		Tare Mass: _	133,982,25
Date/Time	Name	<u>e</u>	Mass
#1 _ 10/6/16 16:59	EZ		133,983.1
#2 10/7/16 0656	BF		133, 982.7
#3		· ————————————————————————————————————	
#4			22.424.5
		Avg	Gain: <u>133, 982-9</u> Gain: <u>0.65</u>
Comments:			
B/H Beaker No.:		I.D. No.:	
Final Mass:		Tare Mass:	
<u>Date/Time</u>	Nam	<u>e</u>	Mass
#1			^
#2		the second second.	
#3			
#4			
C		_	g, Mass:
Comments:			Gain:
B/H Beaker No.:	-		
Final Mass:			
Date/Time	<u>Nam</u>	<u>ne</u>	<u>Mass</u>
#1			
#2		-	
#3		-	· · · · · · · · · · · · · · · · · · ·
#4			
			g. Mass:
Comments:		Net	t Gain:

Site: AK Addletom ICR		Run No.: _	CPMD-3	<u> </u>
Filter No.: 470922		I.D. No.: _	2016-2	276
Final Mass:		Tare Mass:	112.0	
Date/Time	Name	2		Mass
#1 10/6/16 16:50	E2		164	,0
#2 10/7/16 0657	DF		163,	5
#3				
#4				
Comments:		Avg Net	g. Mass: t Gain:	163.75 51.75
PM>10 Beaker No.: 465				
Final Mass:		Tare Mass:	132	,864.30
Date/Time	Name	2		<u>Mass</u>
#1 10/6/16 16:59	EZ		132,	373.1
#2 10/7/16 0657	BF		132,	872.9
#3		<u> </u>		
#4	4779-472			
		Avg	g. Mass:	132, 873.0
Comments: 2.5 <pm<10 beaker="" no.:<="" td=""><td>-</td><td></td><td></td><td>8.7</td></pm<10>	-			8.7
466				78
Final Mass:		Tare Mass:	128,	362.60
Date/Time	Name	2		Mass
#1 10/6/16 17:00	FZ			3,369.5
#2 10/7/16 0658	BE		12.	8, 369, 1
#3				
#4			PE-18-6-3	
				128,369,3
Comments:		Net	t Gain:	6.7

Site: 4K Middleton	Run No.: <u>C-PMD-3</u>				
PM<2.5 Beaker No.:467	I.D. No.: 2016-279				
Final Mass:	Tare Mass: 139,333.15				
<u>Date/Time</u>	<u>Name</u> <u>Mass</u>				
#1 10/6/16 17:01	EZ 139, 337.0				
#2 10/7/16 0658	3= 139, 336.5				
#3					
#4					
Comments:	Avg. Mass:	ta			
B/H Beaker No.:					
Final Mass:	Tare Mass:				
Date/Time	<u>Name</u> <u>Mass</u>	## T			
#1					
#2					
#3	4 . 1				
#4	· · · · · · · · · · · · · · · · · · ·				
Comments:	Avg. Mass: Net Gain:				
B/H Beaker No.:					
Final Mass:	Tare Mass:				
Date/Time	<u>Name</u> <u>Mass</u>				
#1					
#2					
#4					
	Avg. Mass:				
Comments:	Net Gain:				

PROJECT ANALYTICAL SHEET

	BLANK ANALY	SIS	*
Filter No.: 832588	I.D. No.:	2016-280	
Final Mass:	Tare Mass	s:337.95	
Date/Time	Name	Mass	
#1 10/6/16 16:44	EZ.	345,5	
#2 10/7/16 0659	3-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	345,5	
#3	·	,	
#4			
		Avg. Mass: 345.5 Net Gain: 7.53	
Acetone Beaker No.:	168 I.D. No:	2016-281	
Final Mass:	Tare Mass	s: 131,214.25	
Date/Time	Name	Mass	
#1 10/6/16 17:01	EZ	131,214.3	
#2 10/7/16 0659		131, 214.4	
#3			
#4			
,		Avg. Mass:	
DI-Water Beaker No.:	470921 I.D. No	2016-282	ī.
Filter Final Mass:		ss: 112.15	
Date/Time	Name	Mass	
#1 10/6/16 16:45	EZ	112.2	
#2 10/7/16 0654			
#3		-11	
#4			
		Avg. Mass: 1/2.15	
		Net Gain: 0.0	



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6 Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID: EQM100

ALS WO#: L1827087 Date of Report 3-Oct-16

Date of Sample Receipt 9-Sep-16

Client Name

ime: ENVIRONMENTAL QUALITY MANAGEMENT INC.

Client Address: 180

1800 Carillon Boulevard Cincinnati, OH 45240

incinnati, OH 45240

United States
Client Contact: Doug Allen

Client Project ID: 50074.0172 AK STEEL ICR

COMMENTS:

Sample Particulate Analysis via Gravimetric USEPA Method 202 (SA 03-Oct-2016)

LCB = Laboratory Control Blank

CVS = Continuing Verification Standard Sample (limits: ±2 in the last decimal)

LOR = Limit of Reporting

Certified by:

Whitney Davis Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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ALS Canada Ltd L1827087 M202 161003 Page 1 of 3

ALS Environmental

Sample Analysis Summary Report

Sample Name		P-202-1	P-202-2	P-202-3	C-202-1	C-202-
ALS Sample ID		L1827087-1	L1827087-2	L1827087-3	L1827087-4	L1827087-
Matrix .		Stack	Stack	Stack	Stack	Stac
nalysis type		Sample	Sample	Sample	Sample	Samp
ampling Date/Time		29-Aug-16	31-Aug-16	6-Sep-16	6-Sep-16	7-Sep-1
Date of Receipt		9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-1
PM via Gravimetric Analysis	LOR					
Method 202	mg	mg	mg	mg	mg	mg
Extractable Condensible Particulates	0.4	3,5	3.7	3,8	4.9	4.4
Non-Extractale Condensible Particulates	0.4	1.1	1.1	5.6	29.7	25.5
	g	g	g	g	g	g
Water Mass	0.02	227	215	221	159	190

ALS Environmental

Sample Analysis Summary Report

Sample Name		C-202-3	202 BLANK	
ALS Sample ID		L1827087-6	L1827087-7	
Matrix		Stack	Stack	
Analysis type		Sample	Sample	
Sampling Date/Time		7-Sep-16	7-Sep-16	
Date of Receipt		9-Sep-16	9-Sep-16	
PM via Gravimetric Analysis	LOR			
Method 202	mg	mg	mg	
Extractable Condensible Particulates	0.4	13.2	1.4	
Non-Extractale Condensible Particulates	0.4	65.0	0,6	
	g	g	g	





2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270

www.alsglobal.com

LABORATORY REPORT

August 25, 2016

Doug Allen Environmental Quality Management 1800 Carillon Blvd. Cincinnati, OH 45240

RE: AK Middletown ICR / 050074.0172

Dear Doug:

Enclosed are the results of the sample submitted to our laboratory on August 24, 2016. For your reference, this analysis has been assigned our service request number P1604118.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko

Project Manager



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270

www.alsglobal.com

Client: Project: Environmental Quality Management AK Middletown ICR / 050074.0172

Service Request No:

P1604118

CASE NARRATIVE

The sample was received intact under chain of custody on August 24, 2016 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Hydrogen Sulfide Analysis

The sample was analyzed for hydrogen sulfide per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP, LLC accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270

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ALS Environmental - Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA-LAP, LLC	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	977273
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

DETAIL SUMMARY REPORT

Client: Project ID:	Environmental AK Middletown	-	-		Service Request: P1604118
Date Received: Time Received:	8/24/2016 09:50				H2S Bag
) 5504-12 -
Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	ASTM D
P-15-1	P1604118-001	Air	8/23/2016	00:00	X

Environmental Quality Management, Inc.

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Project Name Project Number Project Manager Sample Team Leader

Environmental Quality Management, Inc.

CHAIN OF CUSTODY RECORD ANALYSIS REQUEST AND

Lab Purobase Order No. OSOD74, OJ72. Lab Destination Lab Contact/Phone

@ ERM. won

Allen

Allen

Reference Document No.

Page 1 of _

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825- 7500

SAME

Stod Carrillon いっていれるが 240 Bill to: Report to:

Condition of Receipt (Lab) Requested Analytical Method/(Parameters) EPA- METHOD Servalive J. 17 Pre-ONE CONTAINER PER LINE Sample Volume 7,75 Container Type 849 Date/Time Collected 8/2/16 Sample Description/Type SAMPLE (AAC) Special Instructions: Sample Number 10

(mos.) Return to Client [1 Disposat by Lab 28 Architye. QA Requirements: Normal II Rushoff Results Regulred by 1 DAY TAT Date: 8/2.3/16 Non-hazard Flammabia B Skin Irdian [] Other Thringsound, Cans Required: f. Refinguished by

Sample Disposal:

Possible Hazard Identification

(Signature/Attillation) (Signature/AIIIIation) 1. Received by 2. Received by Time! Dafe: Time: (Signature/Affiliation) (Slgnature/Affiliation) 2. Refingulated by

Dale; Time;

Time; Date

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N.Worms/Porms/Emission Testing/Chain of Custody doc

Comments;

5 of 8

ALS Environmental Sample Acceptance Check Form

		l Quality Managemer			_	Work order:	P1604118			
		vn ICR / 050074,017	2				<u>-</u>			
Sample(s) received on:	8/24/16		_	Date opened:	8/24/16	_ by:	KKELPE		
Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as										
compliance	or nonconformity.	Thermal preservation and	pH will only be	evaluated either a	t the request of th	e client and/or as requ	aired by the meth			
								Yes No	<u>N/A</u>	
1	-	containers properly		•) ?			oxdot		
2	Did sample containers arrive in good condition?									
3		f-custody papers used								
4	-	ontainer labels and/o			pers?					
5	_	olume received adeq	•	sis?						
6	-	ithin specified holdir	-					\boxtimes		
7	Was proper te	mperature (thermal)	preservation) (of cooler at rec	eipt adhered	to?			X	
_								,,,,,	_	
8	Were custody	seals on outside of c		ntainer?					Ш	
		Location of seal(s)?					Sealing Lid?		\boxtimes	
	_	e and date included?							X	
_	Were seals into								X	
9		rs have appropriate p				Client specified i	nformation?		\boxtimes	
		nt indication that the	•		eserved?				X	
		ials checked for prese							×	
		t/method/SOP require	•		ample pH and	if necessary alter	it?		X	
10	Tubes:	Are the tubes cap	_						X	
11	Badges:	Are the badges p							X	
A CONTROL OF THE PROPERTY OF T		Are dual bed bad	ges separated	and individual	ly capped and	intact?			X	
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Recei	pt / Preservati	on	
		Description	pH*	pH	pH	(Presence/Absence)		Comments		
P1604118	-001.01	1 L Zefon Bag								
		· · · · · · · · · · · · · · · · · · ·								
Eveloie	onsi diagrapas -!	ogr (include lab game -1-	II) mumbana):							
_	-	es: (include lab sample se recorded on the chair		he hao					/////////////////////////////////////	
.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	the controlled in	to recorded on the enam	or custody of t	no oag.				······································	***************************************	

RESULTS OF ANALYSIS Page 1 of 1

Client: **Environmental Quality Management**

Client Project ID: AK Middletown ICR / 050074.0172 ALS Project ID: P1604118

Hydrogen Sulfide

Test Code: ASTM D 5504-12

Instrument ID: Agilent 7890A/GC22/SCD Date(s) Collected: 8/23/16

Analyst: Mike Conejo Date Received: 8/24/16 Sample Type: 1 L Zefon Bag(s) Date Analyzed: 8/24/16

Test Notes:

Injection Cliant Sample ID Volume

Chent Sample ID	ALS Sample ID	voiume	Time	Result	MRL	Result	MKL	Data
		ml(s)	Analyzed	μg/m³	μg/m³	ppbV	ppbV	Qualifier
P-15-1	P1604118-001	0.10	10:35	ND	70	ND	50	
Method Blank	P160824-MB	1.0	08:05	ND	7.0	ND	5.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

LABORATORY CONTROL SAMPLE SUMMARY Page 1 of 1

Client: Environmental Quality Management

Client Sample ID: Lab Control Sample

ALS Project ID: P1604118

Client Project ID: AK Middletown ICR / 050074.0172

ALS Sample ID: P160824-LCS

Test Code:

ASTM D 5504-12

Instrument ID:

Agilent 7890A/GC22/SCD

Analyst:

Mike Conejo

Sample Type: Test Notes:

1 L Zefon Bag

Date Collected: NA

Date Received: NA

Date Analyzed: 8/24/16 Volume(s) Analyzed: N

NA ml(s)

CAS#	Compound	Spike Amount	Result	% Recovery	Acceptance	Data
		ppbV	${f ppbV}$		Limits	Qualifier
7783-06-4	Hydrogen Sulfide	1,000	984	98	75-148	



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsglobal.com

LABORATORY REPORT

August 26, 2016

Doug Allen Environmental Quality Management 1800 Carillon Blvd. Cincinnati, OH 45240

RE: AK Steel ICR / 050074.0172

Dear Doug:

Enclosed are the results of the sample submitted to our laboratory on August 25, 2016. For your reference, these analyses have been assigned our service request number P1604137.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko

Project Manager



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Client:

Environmental Quality Management

Project:

AK Steel ICR / 050074.0172

Service Request No:

P1604137

CASE NARRATIVE

The sample was received intact under chain of custody on August 25, 2016 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Hydrogen Sulfide Analysis

The sample was analyzed for hydrogen sulfide per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). Method ASTM D 5504-12 is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP, LLC accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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F: +1 805 526 7270 www.alsglobal.com

ALS Environmental - Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA-LAP, LLC	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp- services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	977273
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

DETAIL SUMMARY REPORT

Service Request: P1604137

ASTM D 5504-12 - H2S Bag

Х

Client:

Environmental Quality Management

Project ID:

AK Steel ICR / 050074.0172

Date Received:

8/25/2016

Time Received:

09:35

Date

Time

Client Sample ID

P-15-2

Lab Code P1604137-001 Matrix Collected Аiг 8/24/2016

Collected

00:00

P1604137_Detail Summary_1608261223_RB.xls - DETAIL SUMMARY

4 of 8

Environmental Quality Management, Inc.

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fronmental Quality agement, Inc. Project Name Project Manager Sample Team Leader Project Number

CHAIN OF CUSTODY RECORD ANALYSIS REQUEST AND

Lab Destination Lab Confact/Phone

Reference Document No. Page 1 of Report to:

いまえん

Bill to: Lab Purchase Order No. . Carrler/Waybill No.

Condition of Receipt (Lab) Requested Analytical Method/(Parameters) METHOD Pre-Ź ONE CONTAINER PER LINE Sample Volume 5.75 Container Type BAG 8/24/16 Date/Time Collected Sample Description/Type BAG SAMPLE Special Instructions: Sample Number

Roburn to Client I Disposal by Lab & Archive_ 1. Received by QA Requirements: Normal II. Rus A Results Required by / DAY THT DOLE: NE 4/16 Thensrownd Thre Required: Refluguished by

(тпоз.)

Sample Disposal;

Non-hasacha Fianunable 🛭 Skin Irriani 🛭 Other 🔔

Possible Hazard Identification;

SC64 182

> Time: Dates

Date: Time;

(Signature/Affillation)

(Signature/Affiliation)

2. Received by

Times Date: Time: (Signature/Attillation) (Slgunture/Actiliation) 2. Refinguished by

Contrants;

N.Wormall orns\Emission Testing\Chain of Custody,doc

5 of 8

ALS Environmental Sample Acceptance Check Form

		l Quality Managemen	t	1		Work order:	P1604137			
		/ 050074.0172							····	
Sample((s) received on:	8/25/16		•	Date opened:	8/25/16	by:	KKELPE	3	
Note: This	form is used for al	l samples received by ALS.	The use of this f	orm for custody s	eals is strictly m	eant to indicate prese	nce/absence and n	ot as an indi	cation	of
compliance	or nonconformity.	Thermal preservation and	pH will only be e	valuated either at	the request of th	e client and/or as req	uired by the metho			
									<u>No</u>	<u>N/A</u>
1		containers properly n		ient sample ID	?					
2	-	ontainers arrive in go								
3		f-custody papers used								
4	-	ontainer labels and/or			ers?					
5	=	olume received adequ	=	is?						
6	=	vithin specified holdin								
7	Was proper te	mperature (thermal p	reservation) o	of cooler at rec	eipt adhered i	to?				X
								_		_
8	Were custody	seals on outside of co		tainer?				_	\boxtimes	
		Location of seal(s)?					_Sealing Lid?			X
	_	e and date included?								\boxtimes
	Were seals int									X
9		rs have appropriate p i	•	_		Client specified	information?			X
		nt indication that the s	-		eserved?					X
	Were VOA v	<u>ials</u> checked for prese	nce/absence o	f air bubbles?						X
	Does the clien	t/method/SOP require	that the analy	st check the sa	mple pH and	if necessary alte	r it?			X
10	Tubes:	Are the tubes capp	ed and intact?	}						X
11	Badges:	Are the badges pr	operly capped	and intact?						\times
		Are dual bed badg	ges separated a	and individual!	y capped and	intact?				X
	9 LTD						and the good see			
LAD	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence		ot / Preser Comments		
D140/127	7 001 01		hir	Pri	hir	(Tiesened/Paseinee		Commens		
P1604137	7-001.01	1 L Zefon Bag								
							1			

							1			
							1			
			***					·		
-	_	es: (include lab sample l								
There is no	ot a collection tim	ne listed on chain of cust	tody or the bag.							
					•					

RESULTS OF ANALYSIS Page 1 of 1

Client:

Environmental Quality Management

Client Project ID: AK Steel ICR / 050074.0172

ALS Project ID: P1604137

Hydrogen Sulfide

Test Code:

ASTM D 5504-12

Instrument ID:

Agilent 6890A/GC13/SCD

Analyst:

Mike Conejo

Sample Type: 1 L Zefon Bag(s)

Test Notes:

Date(s) Collected: 8/24/16 Date Received: 8/25/16

Date Analyzed: 8/25/16

Injection

Client Sample ID	ALS Sample TD	Volume	Time	Result	MRL	Result	MRL	Data
		ml(s)	Analyzed	μg/m³	μg/m³	ppbV	ppbV	Qualifier
P-15-2	P1604137-001	1.0	15:10	16	7.0	12	5.0	
Method Blank	P160825-MB	1.0	07:59	ND	7.0	ND	5.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

LABORATORY CONTROL SAMPLE SUMMARY Page 1 of 1

Client: Environmental Quality Management

Client Sample ID:Lab Control SampleALS Project ID: P1604137Client Project ID:AK Steel ICR / 050074.0172ALS Sample ID: P160825-LCS

Test Code: ASTM D 5504-12 Date Collected: NA
Instrument ID: Agilent 6890A/GC13/SCD Date Received: NA
Analyst: Mike Conejo Date Analyzed: 8/25/16

Sample Type: 1 L Zefon Bag Volume(s) Analyzed: NA ml(s)

Test Notes:

					ALS	
CAS#	Compound	Spike Amount	Result	% Recovery	Acceptance	Data
		ppbV	ppbV		Limits	Qualifier
7783-06-4	Hydrogen Sulfide	1.000	953	95	75-148	



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsqlobal.com

LABORATORY REPORT

August 29, 2016

Doug Allen Environmental Quality Management 1800 Carillon Blvd. Cincinnati, OH 45240

RE: AK Middletown / 050074.0172

Dear Doug:

Enclosed are the results of the sample submitted to our laboratory on August 26, 2016. For your reference, these analyses have been assigned our service request number P1604158.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko

Project Manager



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsglobal.com

Client: Environmental Quality Management

Project: AK Middletown / 050074.0172

Service Request No: P1604158

CASE NARRATIVE

The sample was received intact under chain of custody on August 26, 2016 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

Hydrogen Sulfide Analysis

The sample was analyzed for hydrogen sulfide per modified SCAQMD Method 307-91 and ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). Method ASTM D 5504-12 is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AlHA-LAP, LLC accreditation. Method SCAQMD 307-91 is not included on the laboratory's NELAP, DoD-ELAP, or AlHA-LAP, LLC accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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ALS Environmental - Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA-LAP, LLC	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	977273
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

DETAIL SUMMARY REPORT

			1/1	JII III DOM	ALMET TON ONE
Client:	Environmental	Quality M	lanagement		Service Request: P1604158
Project ID:	AK Middletown	n / 050074	1.0172		
Date Received:	8/26/2016				2S Bag
Time Received:	09:50				
					72
					5504-
				_	A C
			Date	Time	NTS
Client Sample ID	Lab Code	Matrix	Collected	Collected	SA
P-15-3	P1604158-001	Air	8/25/2016	00:00	X



Environmental Quality Management, Inc.

ıl Quality	4K MIDNETOWN
Inc.	0500749172
H' Environmental Quality Management, Inc.	Project Nume Project Number Project Manager Sample Yean Leader

CHAIN OF CUSTODY RECORD ANALYSIS REQUEST AND

Lab Destination Lab Contact/Phone Lab Purchase Order No. Carrier/Waybill No. Carrier/Waybill No. The contact of the contact	
K MIDNETOWN SOBTHOITE ALLEN	

		Condition of	Receipt (Lab)					
1		Requested Analytical	wernow(Parameters)	PA ZEES C	(12)	***		The state of the s
TANE	27.107	Pre-	Diameter 1	Z V		-		
ONE CONTAINER PER 1 TATE		Sample Volume	100	701				
ONE		Container Type	Q4C	t i				
	T. T.	Collected	8/25/11. 046	A 16910				
1	Sample Description/Type	oder mondrage	1-15-3 BAG SAMPLE					
Named Manufacture	MOTIFICATION AND AND AND AND AND AND AND AND AND AN	0 15 3	C C) -		***************************************		Special Instructions:	

	Date: 8/20/C Time: 63/0 Date: Time:
QA Requirements:	1. Received by (Signature/Affiliation) 2. Received by (Signature/Affiliation)
Normal II Rushix Acsults Required by DAY 747	2. Relinquished by Time: 16-15 2. Relinquishtod by Date; Time: 16-15 Comments:

(mos.)

Sample Disposat;
Return to Cilem I Disposat by Lab II Archive....

Non-bazarok Fiammable [] Skin Kritant [] Other ...

Thrustownd This Required;

Possible Hazard Identification:

QA Requirements:

N:\Forms\Torms\Embsslon Testlag\Chain of Custody.doc

ALS Environmental Sample Acceptance Check Form

		l Quality Managemen	t	· .	_	Work order:	P1604158			
		wn / 050074.0172								
Sample	(s) received on:	8/26/2016		-	Date opened:	8/26/2016	by:	ADAV	ID	
		I samples received by ALS. Thermal preservation and		•	•	•			dication	of
1	-	containers properly r			•	e eneme analor as rec	dured by the metho	Yes	<u>No</u> □	<u>N/A</u>
2		ontainers property in ontainers arrive in go		-	' '			\boxtimes		
3	-	f-custody papers used						\boxtimes		
4		ontainer labels and/o			ara?			X		
5	-	volume received adequ			C12 (X		
6	=	vithin specified holdin	=	19:				X		
7	-	mperature (thermal p	_	of acolom at mag	aint adhanad t	-09				\boxtimes
,	was proper te	imperature (thermar)	oreservation) c	n cooler at lec	eipi aunereu i	.07		ш		
8	Were custody	seals on outside of co		tainer?			G 15 T.10		\boxtimes	
	117	Location of seal(s)?					_Sealing Lid?			ΙΖΊ X
	_	e and date included?								\boxtimes
	Were seals int									X
9		rs have appropriate p		-		Client specified	information?			X
		nt indication that the s			eserved?					X
		ials checked for prese								\boxtimes
		t/method/SOP require	•		mple pH and	if necessary alte	r it?			X
10	Tubes:	Are the tubes cap								X
11	Badges:	Are the badges pa	operly capped	l and intact?						X
		Are dual bed badı	ges separated a	and individuall	y capped and	intact?				X
Lab	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence		pt / Prese Commen		
P1604158	3-001.01	1 L Zefon Bag								
			<u></u>							
							<u> </u>			
					···					
							+			
Explair	any discrepanci	es: (include lab sample	ID numbers):			***************************************				

RESULTS OF ANALYSIS
Page 1 of 1

Client: Environmental Quality Management

Client Project ID: AK Middletown / 050074.0172 ALS Project ID: P1604158

Hydrogen Sulfide

Test Code:

ASTM D 5504-12

Instrument ID:

Agilent 7890A/GC22/SCD

Analyst:

Mike Conejo

Sample Type:

1 L Zefon Bag(s)

Date(s) Collected: 8/25/16 Date Received: 8/26/16 Date Analyzed: 8/26/16

Test Notes:

Injection

Client Sample ID	ALS Sample ID	Volume	Time	Result	MRL	Result	MRL	Data
		ml(s)	Analyzed	μg/m³	μg/m³	ppbV	ppbV	Qualifier
P-15-3	P1604158-001	1.0	10:29	ND	7.0	ND	5.0	
Method Blank	P160826-MB	1.0	08:11	ND	7.0	ND	5.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

LABORATORY CONTROL SAMPLE SUMMARY Page 1 of 1

Client: Environmental Quality Management

Client Sample ID: Lab Control Sample ALS Project ID: P1604158

Client Project ID: AK Middletown / 050074.0172 ALS Sample ID: P160826-LCS

Test Code: ASTM D 5504-12 Date Collected: NA

Instrument ID: Agilent 7890A/GC22/SCD Date Received: NA
Analyst: Mike Conejo Date Analyzed: 8/26/16

Sample Type: 1 L Zefon Bag Volume(s) Analyzed: NA ml(s)

Test Notes:

ALS CAS# Compound Spike Amount Result % Recovery Acceptance Data ppbV ppbV Limits Qualifier 7783-06-4 Hydrogen Sulfide 1,000 996 100 75-148



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsglobal.com

LABORATORY REPORT

August 31, 2016

Doug Allen Environmental Quality Management 1800 Carillon Blvd. Cincinnati, OH 45240

RE: AK Middletown / 050074.0172

Dear Doug:

Enclosed are the results of the samples submitted to our laboratory on August 30, 2016. For your reference, these analyses have been assigned our service request number P1604191.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kate Kaneko

Project Manager



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsglobal.com

Client:

Environmental Quality Management

Project:

AK Middletown / 050074.0172

Service Request No:

P1604191

CASE NARRATIVE

The samples were received intact under chain of custody on August 30, 2016 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Hydrogen Sulfide Analysis

The samples were analyzed for hydrogen sulfide per modified SCAQMD Method 307-91 and ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). Method ASTM D 5504-12 is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP or AIHA-LAP, LLC accreditation. Method SCAQMD 307-91 is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP, LLC accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



2655 Park Center Dr., Suite A Simi Valley, CA 93065 T: +1 805 526 7161 F: +1 805 526 7270 www.alsqlobal.com

ALS Environmental - Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
AIHA-LAP, LLC	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2014025
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	977273
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-003
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413- 16-7
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 6-6
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

DETAIL SUMMARY REPORT

Service Request: P1604191

Client:

Environmental Quality Management

Project ID: AK Middletown / 050074.0172

Date Received: Time Received: 8/30/2016

07:45

Date Time

ASTM D 5504-12 - H2S Bag Client Sample ID Lab Code Matrix Collected Collected C-15-1 00:00 P1604191-001 Air 8/29/2016 Х C-15-2 P1604191-002 Air 8/29/2016 00:00 Х C-15-3 P1604191-003 Air 8/29/2016 00:00 X

Environmental Quality Management, Inc.

Environmental Quality

DALLENGERACON CARLLLON Reference Document No. NAME Report to: Doug Puge 1 of BIII to: CHAIN OF CUSTODY RECORD Lab Destination Lab Contact/Phone
Lab Purchase Order No.
Carrier/Waybill No. r_y Project Name AK Middle Town Project Number OSOO74 o 17 ALLEN Малавешені, Іпс. Project Manager Sample Team Leader

ANALYSIS REQUEST AND

, , ,		-,,				·i);		
	Condition of Receipt (Lab)		3,		٠ نـ			
Reginated Aminifor	Method/Parameters) US EPA METHON 15	1 H2S			8 Archive (mos.)	Date:	Date: Tirtie:	
ONB CONTAINER PER LINE ther Sample Pre-				Sample Disposal:	Aveiants to Calcut. II Disposal by Lab Archive	1. Received by (Signstone Amiliaton)	2. Received by (Signature/Affiliation)	*
Container	644				OA Requirements:			
Date/Time	8/29/16-	>			1747	1530		<i>y</i>)**
Sample Description/Type	BAG SAMPLE	>		Possible Hazard Idendarcation: Non-bazard Flammable II Skin Irotani II Other	Tunnaround Aline Required: Normal II Rushed Results Required by L. DAY T	n) My Times	n) Time:	-
Stropio Number	(C-18-1)	0 C-15-3	Special Lastructions:	Possible Hazard Identification: Non-incard Framinable II Sh	Tunnsround Time Required: Normal II Rush Results	1. Relaquished by (Signature/Affiliation)	2. Relinquished by (Signature/Attitiation) Comments:	

N.WonnsMorms/Emission Testing/Chain of Custady.doc

ALS Environmental Sample Acceptance Check Form

		l Quality Managemen	t	-	_	Work order:	P1604191				
	ct: AK Middletown / 050074.0172 le(s) received on: 8/30/16			Data ananadi	9/20/16	brzz	KKELP:	E			
Sample	s) received on.	8/30/10		•	Date opened:	8/30/10	- by:	KKELP.	E		
Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of											
compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP. Yes No N/A											
1	Were sample	containers properly n	narked with cl	ient sample ID)?			X			
2	Did sample containers arrive in good condition?										
3	Were chain-of-custody papers used and filled out?										
4	Did sample container labels and/or tags agree with custody papers?										
5	Was sample volume received adequate for analysis?										
6	Are samples w	Are samples within specified holding times?									
7	Was proper temperature (thermal preservation) of cooler at receipt adhered to?									\boxtimes	
		• ` ` .	,		•						
8	Were custody seals on outside of cooler/Box/Container?								$\overline{\times}$		
	Location of seal(s)?									X	
	Were signature and date included?										
	Were seals intact?									X	
9	Do containers have appropriate preservation , according to method/SOP or Client specified information?									X	
	Is there a client indication that the submitted samples are pH preserved? Were VOA vials checked for presence/absence of air bubbles?									X	
										X	
	Does the clien	t/method/SOP require	that the analy	st check the sa	ımple pH and	if necessary alter	it?			\times	
	Tubes:	lient/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?									
11	Badges:	Are the badges properly capped and intact?								\times	
	Badges: Are the badges properly capped and intact? Are dual bed badges separated and individually capped and intact?									X	
Lab	Sample ID	Container Description	Required pH *	Received	Adjusted pH	VOA Headspace (Presence/Absence)		pt / Preser Comment			
21.604101	001.01		pπ	pH	μα	(Fiesence/Absence)		Committee	•		
P1604191 P1604191		1 L Zefon Bag									
P1604191		1 L Zefon Bag 1 L Zefon Bag								i	
1 1004171	-005.01	I L Zelon Dag									
										-	
Explain	any discrepanci	es: (include lab sample l	ID numbers):						. ———		
Absence of collection times on chain of custody or bags.											

RESULTS OF ANALYSIS Page 1 of 1

Client: **Environmental Quality Management**

Client Project ID: AK Middletown / 050074.0172 ALS Project ID: P1604191

Hydrogen Sulfide

ASTM D 5504-12 Test Code:

Instrument ID: Agilent 6890A/GC13/SCD

Date(s) Collected: 8/29/16 Analyst: Mike Conejo Date Received: 8/30/16 Sample Type: 1 L Zefon Bag(s) Date Analyzed: 8/30/16

Test Notes:

		Injection						
Client Sample ID	ALS Sample ID	Volume	Time	Result	MRL	Result	MRL	Data
		ml(s)	Analyzed	μg/m³	μg/m³	ppbV	ppbV	Qualifier .
C-15-1	P1604191-001	1.0	08:45	8.5	7.0	6.1	5.0	
C-15-2	P1604191-002	1.0	09:04	22	7.0	16	5.0	
C-15-3	P1604191-003	1.0	09:22	68	7.0	49	5.0	
Method Blank	P160830-MB	1.0	08:07	ND	7.0	ND	5.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY Page 1 of 1

Client:

Environmental Quality Management

Client Sample ID: Lab Control Sample

ALS Project ID: P1604191

Date Collected: NA

Date Received: NA

Client Project ID: AK Middletown / 050074.0172

ALS Sample ID: P160830-LCS

Test Code:

ASTM D 5504-12

Instrument ID:

Agilent 6890A/GC13/SCD

Analyst:

Mike Conejo

Sample Type:

1 L Zefon Bag

Date Analyzed: 8/30/16 Volume(s) Analyzed:

NA ml(s)

Test Notes:

					ALS	
CAS#	Compound	Spike Amount	Result	% Recovery	Acceptance	Data
		${\sf ppbV}$	ppbV		Limits	Qualifier
7783-06-4	Hydrogen Sulfide	1,000	1,060	106	75-148	





Date: 29-Sep-2016

ENVIRONMENTAL QUALITY MANAGEMENT INC 1800 CARILLON BLVD CINCINNATI **UNITED STATES**

45240

The results shown in this test report specifically refer to the sample(s) tested as received unless otherwise stated. All tests have been performed using the latest revision of the methods indicated, unless specifically marked otherwise on the report. Precision parameters apply in the determination of the below results. Users of the data shown on this report should refer to the latest published revisions of ASTM D3244; IP 367 and ISO 4259 and when utilising the test data to determine conformance with any specification or process requirement. With respect to the UOP methods listed in the report below the user is referred to the method and the statement within it specifying that the precision statements were determined using UOP Method999. This Test Report is issued under the Company's General Conditions of Service (copy available upon request or on the company website at www.sgs.com). Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. This report shall not be reproduced except in full, without the written approval of the laboratory.

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

CLIENT ORDER NUMBER: LOCATION:

SAMPLE SOURCE:

SAMPLE TYPE:

SAMPLED:

ANALYSED:

500740172

Cinncinnati Ohio

As Supplied As Submitted

30-Aug-2016 20-Sep-2016 SGS ORDER NO.:

PRODUCT DESCRIPTION:

SOURCE ID: SAMPLED BY:

Run 1 Client

4028848

Gas - Coker Oven Gas Sample

RECEIVED 08-Sep-2016 COMPLETED: 28-Sep-2016

PROPERTY METHOD **RESULT UNITS** MIN MAX Hydrocarbons and Non-Hydrocarbon **ASTM D7833** Gases in Gaseous Mixtures by GC Hydrogen by TCD 4.67 % Mole Nitrogen by TCD 74.35 % Mole 17.73 % Mole Oxygen by TCD Carbon Monoxide by TCD 0.70 % Mole 0.44 % Mole Carbon Dioxide by TCD Hydrogen Sulfide by TCD§ <0.03 % Mole 1.84 % Mole Methane by FID 0.07 % Mole Ethaneby FID Propane by FID 0.005 % Mole Propylene by FID 0.01 % Mole <0.005 % Mole Iso-Butane by FID <0.005 % Mole n-Butane by FID Iso-Pentane by FID <0.005 % Mole n-Pentane by FID <0.005 % Mole Neopentane by FID <0.005 % Mole C5-Olefins by FID <0.005 % Mole <0.005 % Mole Cis-2-Butene by FID <0.005 % Mole Trans-2-Butene by FID <0.005 % Mole 1,3-Butadiene by FID 0.02 % Mole Benzene by FID <0.005 % Mole n-Hexane by FID <0.005 % Mole Heptanes and Heavier by FID C8 Plus by FID § 0.01 % Mole ASTM D3588 0.9996 ---Compressibility Factor Ideal Relative Density ASTM D3588 0.9454 ---580 Btu/lbm Ideal Gross Heating Value ASTM D3588

§ - Analyte not in published method scope

SGS North America Inc.

AUTHORISED SIGNATORY

Mankata Inkumsah Lab Supervisor

2909201619070000179443

OGC-En_report-2014-08-12_v59i

Oil, Gas & Chemicals Services 1201A West 8th Street, Deer Park, TX, 77536, U.S.A. Tel: +1-(281)-479-7170



Date: 29-Sep-2016

ENVIRONMENTAL QUALITY MANAGEMENT INC

28-Sep-2016

1800 CARILLON BLVD

CINCINNATI **UNITED STATES**

45240

CLIENT ORDER NUMBER:

LOCATION: SAMPLE SOURCE:

SAMPLE TYPE: SAMPLED: ANALYSED:

500740172 Cinncinnati Ohio

As Supplied As Submitted 30-Aug-2016

20-Sep-2016

SGS ORDER NO.:

PRODUCT DESCRIPTION: SOURCE ID

SAMPLED BY: RECEIVED COMPLETED:

4028848 Gas - Coker Oven Gas Sample

Run 1 Client 08-Sep-2016

PROPERTY

METHOD

RESULT UNITS

MIN MAX

Ideal Gross Heating Value

ASTM D3588

42.6 Btu/ft3

This document is only valid in its entirety and your attention is drawn to the Terms and Conditions on Page 1 of this report

AUTHORISED SIGNATORY

Mankata Inkumsah Lab Supervisor

2909201619070000179443

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SGS North America Inc.

Oil, Gas & Chemicals Services 1201A West 8th Street, Deer Park, TX, 77536, U.S.A. Tel: +1-(281)-479-7170



Date: 29-Sep-2016

ENVIRONMENTAL QUALITY MANAGEMENT INC

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CINCINNATI UNITED STATES

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WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

CLIENT ORDER NUMBER: 500740172 SGS ORDER NO.: 4028848
LOCATION: PRODUCT DESCRIPTION: Gas - Coker Oven Gas Sample

Cinncinnati Ohio PRODUCT DESCRIPTION : As Supplied SOURCE ID :

SOURCE ID: Run 2 SAMPLED BY: Client

Client

SAMPLE TYPE: As Submitted SAMPLED: 01-Sep-2016 ANALYSED: 20-Sep-2016

SAMPLE SOURCE:

RECEIVED COMPLETED:

08-Sep-2016 28-Sep-2016

ANALISED.	20-3ep-2010	Allege Colored Control of the Colored Colored	COMIT LETED.	20 0	cp-2010	
PROPERTY		METHOD	RESULT	UNITS	MIN	MAX
Hydrocarbons and Non-Hyd	drocarbon A	ASTM D7833				
Gases in Gaseous Mixtures	s by GC					
Hydrogen by TCD				% Mole	777	
Nitrogen by TCD				% Mole	(MAC)	
Oxygen by TCD				% Mole		1000
Carbon Monoxide by TCD				% Mole	(20)	022
Carbon Dioxide by TCD				% Mole	·	
Hydrogen Sulfide by TCD	§			% Mole	5 50,0 3	0.77
Methane by FID				% Mole	(Section)	
Ethaneby FID				% Mole	(##)	1999
Propane by FID				% Mole		7/2223
Propylene by FID				% Mole	:=+:	188
Iso-Butane by FID				% Mole	1774	5. 565
n-Butane by FID				% Mole	(44)	
Iso-Pentane by FID			<0.005		(##)	***
n-Pentane by FID			<0.005		144	22
Neopentane by FID			<0.005	% Mole	(**)	
C5-Olefins by FID			<0.005			
Cis-2-Butene by FID			<0.005	% Mole		222
Trans-2-Butene by FID			<0.005		5 77 5	
1,3-Butadiene by FID				% Mole		22
Benzene by FID			0.58	% Mole	(
n-Hexane by FID				% Mole	-	77
Heptanes and Heavier by	FID		< 0.005	% Mole	1221	
C8 Plus by FID §			0.07	% Mole	8 8.4	
Compressibility Factor	A	ASTM D3588	0.9996			22
Ideal Relative Density	A	ASTM D3588	0.6029			22
Ideal Gross Heating Value	A	ASTM D3588		Btu/lbm		22
Ideal Gross Heating Value	F	ASTM D3588	378.4	Btu/ft³	(99)	22

§ - Analyte not in published method scope

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AUTHORISED SIGNATORY

Mankata Inkumsah Lab Supervisor

2909201619070000179443

Page 3 of 6

OGC-En_report-2014-08-12_v59i

SGS North America Inc.
Oil, Gas & Chemicals Services 1201A West 8th Street, Deer Park, TX, 77536, U.S.A. Tel: +1-(281)-479-7170



Date: 29-Sep-2016

ENVIRONMENTAL QUALITY MANAGEMENT INC

4028848

1800 CARILLON BLVD

CINCINNATI

UNITED STATES

45240

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

CLIENT ORDER NUMBER: 500740172

LOCATION:

SAMPLE SOURCE:

SAMPLE TYPE:

SAMPLED:

ANALYSED

Cinncinnati Ohio

As Supplied As Submitted

06-Sep-2016

SGS ORDER NO.:

PRODUCT DESCRIPTION:

SOURCE ID:

Gas - Coker Oven Gas Sample Sample 1 Client

SAMPLED BY: RECEIVED COMPLETED:

12-Sep-2016 28-Sep-2016

20-Sep-2016 METHOD

ANALIGED.	20-36p-2010		COM LETED.	200	CP-2010	
PROPERTY		METHOD	RESULT	UNITS	MIN	MAX
Hydrocarbons and Non-Hy	drocarbon	ASTM D7833				
Gases in Gaseous Mixture	s by GC			No. 100. The Contraction of		
Hydrogen by TCD				% Mole		
Nitrogen by TCD				% Mole	2 7.	77
Oxygen by TCD				% Mole	(26)	22
Carbon Monoxide by TCE	כ			% Mole	- 10	
Carbon Dioxide by TCD				% Mole		
Hydrogen Sulfide by TCD)§			% Mole	(44)	****
Methane by FID				% Mole	6 777)	
Ethaneby FID				% Mole		20
Propane by FID				% Mole	Dental Control	770
Propylene by FID				% Mole	(<u>AL</u>)	22
Iso-Butane by FID				% Mole	(ma)	
n-Butane by FID			<0.005			20,77
Iso-Pentane by FID			<0.005		7 <u>22</u> 0	
n-Pentane by FID			< 0.005		E nn .	MPC .
Neopentane by FID			<0.005			
C5-Olefins by FID			<0.005		3990	
Cis-2-Butene by FID			< 0.005		(55)	77
Trans-2-Butene by FID			<0.005		1921	202
1,3-Butadiene by FID				% Mole		
Benzene by FID				% Mole		
n-Hexane by FID				% Mole	-	125
Heptanes and Heavier by	/ FID		< 0.005		2 44 44 5 2 (24 44 44 44	77
C8 Plus by FID §			0.05	% Mole	5 <u>267</u> 2	22
Compressibility Factor		ASTM D3588	0.9997		(-	
Ideal Relative Density	9	ASTM D3588	0.4594		-	
Ideal Gross Heating Value	1	ASTM D3588	12521	Btu/lbm		

§ - Analyte not in published method scope

SGS North America Inc.

This document is only valid in its entirety and your attention is drawn to the Terms and Conditions on Page 1 of this report

ASTM D3588

AUTHORISED SIGNATORY

Ideal Gross Heating Value

Mankata Inkumsah Lab Supervisor

2909201619070000179443

Page 4 of 6

OGC-En_report-2014-08-12_v59i

Member of the SGS Group (Société Générale de Surveillance)

Oil, Gas & Chemicals Services 1201A West 8th Street, Deer Park, TX, 77536, U.S.A. Tel: +1-(281)-479-7170

448.2 Btu/ft3



Date: 29-Sep-2016

ENVIRONMENTAL QUALITY MANAGEMENT INC

1800 CARILLON BLVD

CINCINNATI **UNITED STATES**

45240

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

SGS ORDER NO .: 4028848 CLIENT ORDER NUMBER: 500740172

LOCATION : Cinncinnati Ohio

As Supplied SAMPLE SOURCE: SAMPLE TYPE: As Submitted

07-Sep-2016 SAMPLED:

PRODUCT DESCRIPTION:

Gas - Coker Oven Gas Sample

SOURCE ID: Sample 2 SAMPLED BY: Client RECEIVED

12-Sep-2016

COMPLETED: 28-Sep-2016 ANALYSED: 20-Sep-2016 **RESULT UNITS** MIN MAX **PROPERTY METHOD** Hydrocarbons and Non-Hydrocarbon **ASTM D7833**

The state of the s					4
Gases in Gaseous Mixtures by GC					
Hydrogen by TCD			% Mole	-	175
Nitrogen by TCD			% Mole	1972	5 <u>00</u> 5
Oxygen by TCD			% Mole		
Carbon Monoxide by TCD			% Mole		
Carbon Dioxide by TCD			% Mole		441
Hydrogen Sulfide by TCD§			% Mole	ent of	1 77 5
Methane by FID			% Mole	<u> </u>	
Ethaneby FID		(E00), 3	% Mole		(44)
Propane by FID			% Mole		
Propylene by FID			% Mole		: 00 2
Iso-Butane by FID		0.01	% Mole	10/17	i nt e
n-Butane by FID		< 0.005	% Mole		
Iso-Pentane by FID		< 0.005			
n-Pentane by FID		< 0.005			
Neopentane by FID			% Mole	1200	
C5-Olefins by FID			% Mole	1 777	
Cis-2-Butene by FID			% Mole	<u> </u>	
Trans-2-Butene by FID		< 0.005			
1,3-Butadiene by FID			% Mole	=	
Benzene by FID			% Mole	-	(44)
n-Hexane by FID			% Mole		i an s
Heptanes and Heavier by FID		< 0.005	% Mole		
C8 Plus by FID §		0.08	% Mole		S am S
Compressibility Factor	ASTM D3588	0.9996		-	(**
Ideal Relative Density	ASTM D3588	0.4866	k aas	-	
Ideal Gross Heating Value	ASTM D3588	12248	Btu/lbm		
Ideal Gross Heating Value	ASTM D3588	463.4	Btu/ft³	(4)	

§ - Analyte not in published method scope

This document is only valid in its entirety and your attention is drawn to the Terms and Conditions on Page 1 of this report

AUTHORISED SIGNATORY

Mankata Inkumsah Lab Supervisor

2909201619070000179443

Page 5 of 6

OGC-En_report-2014-08-12_v59i

Oil, Gas & Chemicals Services 1201A West 8th Street, Deer Park, TX, 77536, U.S.A. Tel: +1-SGS North America Inc. (281)-479-7170



Date: 29-Sep-2016

ENVIRONMENTAL QUALITY MANAGEMENT INC

1800 CARILLON BLVD

CINCINNATI UNITED STATES 45240

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

CLIENT ORDER NUMBER: 500740172 SGS ORDER NO.: 4028848

LOCATION: Cinncinnati Ohio PRODUCT DESCRIPTION: SAMPLE SOURCE: As Supplied SOURCE ID:

SAMPLE SOURCE: As Supplied SOURCE ID: SAMPLE TYPE: As Submitted SAMPLE DBY:

 SAMPLED:
 07-Sep-2016
 RECEIVED

 ANALYSED:
 20-Sep-2016
 COMPLETED:

DDUCT DESCRIPTION : Gas - Coker Oven Gas Sample JRCE ID : COG

 MPLED BY :
 Client

 CEIVED
 12-Sep-2016

 MPLETED :
 28-Sep-2016

Hydrocarbons and Non-Hydrocarbon Gases in Gaseous Mixtures by GC Hydrogen by TCD Nitrogen by TCD Oxygen by TCD Carbon Monoxide by TCD Carbon Dioxide by TCD Hydrogen Sulfide by TCD Methane by FID	42.29 22.46 2.92 5.16 2.90 <0.03 20.53 0.96 0.05	% Mole	-	
Hydrogen by TCD Nitrogen by TCD Oxygen by TCD Carbon Monoxide by TCD Carbon Dioxide by TCD Hydrogen Sulfide by TCD Methane by FID	22.46 2.92 5.16 2.90 <0.03 20.53 0.96 0.05	% Mole	-	
Nitrogen by TCD Oxygen by TCD Carbon Monoxide by TCD Carbon Dioxide by TCD Hydrogen Sulfide by TCD§ Methane by FID	22.46 2.92 5.16 2.90 <0.03 20.53 0.96 0.05	% Mole	-	
Oxygen by TCD Carbon Monoxide by TCD Carbon Dioxide by TCD Hydrogen Sulfide by TCD§ Methane by FID	2.92 5.16 2.90 <0.03 20.53 0.96 0.05	% Mole % Mole % Mole % Mole % Mole % Mole	-	
Carbon Monoxide by TCD Carbon Dioxide by TCD Hydrogen Sulfide by TCD§ Methane by FID	5.16 2.90 <0.03 20.53 0.96 0.05	% Mole % Mole % Mole % Mole % Mole	- - - -	
Carbon Dioxide by TCD Hydrogen Sulfide by TCD§ Methane by FID	2.90 <0.03 20.53 0.96 0.05	% Mole % Mole % Mole % Mole	- - -	
Hydrogen Sulfide by TCD§ Methane by FID	<0.03 20.53 0.96 0.05	% Mole % Mole % Mole		-
Methane by FID	20.53 0.96 0.05	% Mole % Mole	569 (1==1 1070	
Fig. 10 (10) The Control of the Cont	0.96 0.05	% Mole	(***)	
l ea l éis	0.05			
Ethaneby FID		% Mole		
Propane by FID	0.47			
Propylene by FID		% Mole	(444)	77
Iso-Butane by FID		% Mole	22	
n-Butane by FID		% Mole	i	
Iso-Pentane by FID	<0.005	% Mole	N TO !	
n-Pentane by FID	< 0.005	% Mole		-
Neopentane by FID	<0.005		-	
C5-Olefins by FID	<0.005	% Mole	10 <u>2-0</u> 1	
Cis-2-Butene by FID	< 0.005	% Mole		
Trans-2-Butene by FID	<0.005		11 77	85
1,3-Butadiene by FID	0.02	% Mole		44
Benzene by FID	0.66	% Mole		
n-Hexane by FID	0.02	% Mole		
Heptanes and Heavier by FID	< 0.005	% Mole	(
C8 Plus by FID §	0.09	% Mole	77	
Compressibility Factor ASTM D358	0.9995	<u>1222</u>		
Ideal Relative Density ASTM D358	0.5392	(<u>*185</u>)	==	24
Ideal Gross Heating Value ASTM D356	10772	Btu/lbm		
Ideal Gross Heating Value ASTM D356				
racar cross floating value	of Analytical Results **			

§ - Analyte not in published method scope

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AUTHORISED SIGNATORY

Mankata Inkumsah Lab Supervisor

2909201619070000179443

Page 6 of 6

OGC-En_report-2014-08-12_v59i

SGS North America Inc.
Oil, Gas & Chemicals Services 1201A West 8th Street, Deer Park, TX, 77536, U.S.A. Tel: +1-(281)-479-7170





10-Oct-2016

Doug Allen
Environmental Quality Management
1800 Carillon Boulevard
Cincinnati, OH 45240

Tel: (513) 825-7500 Fax: (513) 825-7495

Re: AKSteel ICR Project # 050074.0172 Work Order: 1609064

Dear Doug,

ALS Environmental received 6 samples on 02-Sep-2016 11:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 15.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Chris Gibson

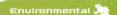
Electronically approved by: Chris Gibson

Chris Gibson

Project Manager

ADDRESS 4388 Glendale Milford Rd. Cincinnati, Ohio 45242- | PHONE (513) 733-5336 | FAX (513) 733-5347

ALS GROUP USA, CORP. Part of the ALS Group. An ALS Limited Company



ALS Environmental Date: 10-Oct-16

Client: Environmental Quality Management

Project: AKSteel ICR Project # 050074.0172

Work Order: 1609064

Lab Samp II	Client Sample ID	<u>Matrix</u>	Tag Number	Collection Date	Date Received	<u>Hold</u>
1609064-01	P-316-1	Impinger		8/30/2016	9/2/2016 11:30	
1609064-02	P-316-2	Impinger		8/31/2016	9/2/2016 11:30	
1609064-03	P-316-3	Impinger		9/1/2016	9/2/2016 11:30	
1609064-04	P-0031-1	Impinger		8/30/2016	9/2/2016 11:30	
1609064-05	P-0031-2	Impinger		8/31/2016	9/2/2016 11:30	
1609064-06	P-0031-3	Impinger		9/1/2016	9/2/2016 11:30	

Work Order Sample Summary

ALS Environmental

Date: 10-Oct-16

Client: Environmental Quality Management

Project: AKSteel ICR Project # 050074.0172 Case Narrative

Work Order: 1609064

Formaldehyde analysis - fraction A is impingers 1 and 2, fraction B is impinger 3.

Date: 10-Oct-16

Client: Environmental Quality Management

Project: AKSteel ICR Project # 050074.0172

Sample ID: P-316-1

Collection Date: 8/30/2016

Work Order: 1609064

Lab ID: 1609064-01 Matrix: IMPINGER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
FORMALDEHYDE EMISSION	IS BY EPA 316		E316			Analyst: SBD
Formaldehyde	ND		0.0025	mg/sample	1	9/13/2016
Formaldehyde	ND		0.0025	mg/sample	1	9/13/2016

Collection Date: 8/31/2016

Date: 10-Oct-16

Client:

Environmental Quality Management

Project:

AKSteel ICR Project # 050074.0172

Sample ID:

P-316-2

Work Order: 1609064

Lab ID: 1609064-02

Matrix: IMPINGER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
FORMALDEHYDE EMISSIO	NS BY EPA 316		E316			Analyst: SBD
Formaldehyde	ND		0.0025	mg/sample	1	9/13/2016
Formaldehyde	0.0067		0.0025	mg/sample	1	9/13/2016

Date: 10-Oct-16

Client:

Environmental Quality Management

Project:

AKSteel ICR Project # 050074.0172

Sample ID:

P-316-3

Work Order: 1609064

Lab ID: 1609064-03
Matrix: IMPINGER

Collection Date: 9/1/2016

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
FORMALDEHYDE EMISSION	NS BY EPA 316		E316			Analyst: SBD
Formaldehyde	ND		0.0025	mg/sample	1	9/13/2016
Formaldehyde	0.084		0.0025	mg/sample	1	9/13/2016

Collection Date: 8/30/2016

Date: 10-Oct-16

Client:

Environmental Quality Management

Project:

AKSteel ICR Project # 050074.0172

Sample ID:

P-0031-1

Work Order: 1609064

Lab ID: 1609064-04 Matrix: IMPINGER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			SW826	0B		Analyst: LAK
1,1,1-Trichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
1,1,2,2-Tetrachloroethane	ND	H	5.0	μg/L	1	9/8/2016 01:44 PM
1,1,2-Trichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
1,1-Dichloroethene	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
1,2-Dichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
1,2-Dichloropropane	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Benzene	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Bromoform	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Bromomethane	ND	Н	5.0	μg/L	1	9/8/2016 01;44 PM
Carbon disulfide	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Carbon tetrachloride	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Chlorobenzene	ND	Н	5.0	µg/L	1	9/8/2016 01:44 PM
Chloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Chloroform	ND	Н	5.0	μg/L.	1	9/8/2016 01:44 PM
Chloromethane	ND	Н	5.0	μg/L_	1	9/8/2016 01:44 PM
Ethylbenzene	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Methylene chloride	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Styrene	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Tetrachloroethene	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Toluene	ND	Н	5.0	μg/L	1	9/8/2016 01:44 PM
Vinyl chloride	ND	Н	2.0	μg/L	1	9/8/2016 01:44 PM
Xylenes, Total	ND	Н	10	μg/L	1	9/8/2016 01:44 PM
Surr: 4-Bromofluorobenzene	99.2		61-131	%REC	1	9/8/2016 01:44 PM
Surr: Dibromofluoromethane	97.2		87-126	%REC	1	9/8/2016 01:44 PM
Surr: Toluene-d8	101		84-111	%REC	1	9/8/2016 01:44 PM

Date: 10-Oct-16

Work Order: 1609064

Client: Environmental Quality Management

Project: AKSteel ICR Project # 050074.0172

 Sample ID:
 P-0031-2
 Lab ID:
 1609064-05

 Collection Date:
 8/31/2016
 Matrix:
 IMPINGER

	D 1/		Report	T T 4.	Dilution	Data Analona I
Analyses	Result	Qual	Limit	Units	Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			SW826	60B		Analyst: LAK
1,1,1-Trichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
1,1,2,2-Tetrachloroethane	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
1,1,2-Trichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
1,1-Dichloroethene	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
1,2-Dichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
1,2-Dichloropropane	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Benzene	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Bromoform	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Bromomethane	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Carbon disulfide	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Carbon tetrachloride	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Chlorobenzene	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Chloroethane	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Chloroform	NĐ	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Chloromethane	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Ethylbenzene	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Methylene chloride	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Styrene	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Tetrachloroethene	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Toluene	ND	Н	5.0	μg/L	1	9/8/2016 02:14 PM
Vinyl chloride	ND	H	2.0	μg/L	1	9/8/2016 02:14 PM
Xylenes, Total	ND	Н	10	μg/L	1	9/8/2016 02:14 PM
Surr: 4-Bromofluorobenzene	99.3		61-131	%REC	1	9/8/2016 02:14 PM
Surr: Dibromofluoromethane	97.1		87-126	%REC	1	9/8/2016 02:14 PM
Surr: Toluene-d8	102		84-111	%REC	1	9/8/2016 02:14 PM

Date: 10-Oct-16

Work Order: 1609064

Client: Environmental Quality Management

Project: AKSteel ICR Project # 050074.0172

 Sample ID:
 P-0031-3
 Lab ID:
 1609064-06

 Collection Date:
 9/1/2016
 Matrix:
 IMPINGER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			SW826	60B		Analyst: LAK
1,1,1-Trichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
1,1,2,2-Tetrachloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
1,1,2-Trichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
1,1-Dichloroethene	ND	Н	5.0	μg/Ľ	1	9/8/2016 01:14 PM
1,2-Dichloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
1,2-Dichloropropane	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Benzene	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Bromoform	ND	H	5.0	μg/L	1	9/8/2016 01:14 PM
Bromomethane	ND	H	5.0	μg/L	1	9/8/2016 01:14 PM
Carbon disulfide	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Carbon tetrachloride	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Chlorobenzene	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Chloroethane	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Chloroform	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Chloromethane	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Ethylbenzene	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Methylene chloride	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Styrene	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Tetrachioroethene	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Toluene	ND	Н	5.0	μg/L	1	9/8/2016 01:14 PM
Vinyl chloride	ND	Н	2.0	μg/L	1	9/8/2016 01:14 PM
Xylenes, Total	ND	Н	10	μg/L	1	9/8/2016 01:14 PM
Surr: 4-Bromofluorobenzene	98.6		61-131	%REC	1	9/8/2016 01:14 PM
Surr: Dibromofluoromethane	95.6		87-126	%REC	1	9/8/2016 01:14 PM
Surr: Toluene-d8	101		84-111	%REC	1	9/8/2016 01:14 PM

Note:

Date: 10-Oct-16

QC BATCH REPORT

Client:

Environmental Quality Management

Work Order:

1609064

Project:

AKSteel ICR Project # 050074.0172

Batch ID: R132682 Instrument ID VMS1

Method: SW8260B

MBLK Sample ID: MBLK-R132	682			U	nits: µg/L		Analysis Date: 9/8/2016 08:09 AM				
Client ID:	Run I	D: VMS1_	160908A		No: 1351 5	i09	Prep Date;		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
1,1,1-Trichloroethane	ND	5.0									
1,1,2,2-Tetrachloroethane	ND	5.0									
1,1,2-Trichloroethane	ND	5.0									
1,1-Dichtoroethene	ND	5.0									
1,2-Dichloroethane	ND	5.0									
1,2-Dichloropropane	ND	5.0									
Benzene	ND	5.0									
Bromoform	ND	5.0									
Bromomethane	ND	5.0									
Carbon disulfide	ND	5,0									
Carbon tetrachloride	ND	5,0									
Chlorobenzene	ND	5.0									
Chloroethane	ND	5,0									
Chloroform	ND	5.0									
Chloromethane	ND	5.0									
Ethylbenzene	ND	5.0									
Methylene chloride	ND	5.0									
Styrene	ND	5.0									
Tetrachloroethene	ND	5.0									
Toluene	ND	5.0									
/inyl chloride	ND	2.0									
Kylenes, Total	ND	10									
Surr: 4-Bromofluorobenzene	52.09	0	50	0	104	61-131		0			
Surr: Dibromofluoromethane	48.3	0	50	0	96.6	87-126		0			
Surr: Toluene-d8	50.12	0	50	0	100	84-111		0			

Environmental Quality Management

Work Order:

1609064

Project:

AKSteel ICR Project # 050074.0172

Batch ID: R132682 Instrument ID VMS1 Method: SW8260B

LCS Sample ID: LCS-R132682				Uni	ts: µg/L		Analysis Date: 9/8/2	2016 08:39 AM
Client ID:	Run	ID: VMS1_	160908A	SeqN	lo: 1351 5	i10 F	Prep Date:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value %RPD	RPD Limit Qual
1,1,1-Trichloroethane	47.94	5.0	50	0	95.9	48.4-140	0	
1,1-Dichloroethene	45.11	5.0	50	0	90.2	45.5-150	0	
1,2-Dichloroethane	50.63	5.0	50	0	101	46.5-141	0	
Benzene	47.11	5.0	50	0	94.2	50.7-134	0	
Carbon tetrachloride	47.15	5.0	50	0	94.3	45.5-143	0	
Chlorobenzene	48.2	5.0	50	0	96.4	45-133	0	
Chloroform	49.25	5,0	50	0	98.5	52.4-136	0	
Ethylbenzene	47.67	5,0	50	0	95.3	37.8-145	0	
Styrene	49.68	5.0	50	0	99.4	26.3-172	0	
Tetrachloroethene	50.26	5.0	50	0	101	37.3-139	0	
Toluene	47.89	5.0	50	0	95.8	44-135	0	
Xylenes, Total	145.7	10	150	0	97.1	47.3-132	0	
Surr: 4-Bromofluorobenzene	48.55	0	50	0	97.1	61-131	0	
Surr: Dibromofluoromethane	50.21	0	50	0	100	87-126	0	
Surr: Toluene-d8	50.64	0	50	0	101	84-111	0	

IS Sample ID: 1609071-05A MS				Units	s: µg/L		Analysis Date: 9/8/2016 09:09 AM				
Client ID;	Run IC): VMS1_1(60908A	SegNo	o: 13515	111	Prep Date:	DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD ^{Limit} Qual			
1,1,1-Trichloroethane	44.22	5.0	50	0	88.4	40.4-134	0				
1,1-Dichloroethene	40.05	5.0	50	0	80.1	45.3-151	0				
1,2-Dichloroethane	45.82	5.0	50	0	91.6	37-139	0				
Benzene	43.28	5.0	50	0	86.6	37.4-144	. 0				
Carbon tetrachloride	43.45	5.0	50	0	86.9	33.8-150	0				
Chlorobenzene	45.3	5.0	50	0	90.6	52.4-132	. 0				
Chloroform	45.62	5.0	50	0	91.2	45.5-135	0				
Ethylbenzene	44.5	5.0	50	0	89	46.5-146	0				
Styrene	45.69	5.0	50	0	91.4	20.9-184	0				
Tetrachioroethene	45.3	5.0	50	0	90.6	55.2-134	0				
Toluene	44.83	5.0	50	0	89.7	32.7-140	0				
Xylenes, Total	136.1	10	150	0	90.7	43.6-148	0				
Surr: 4-Bromofluorobenzene	48.11	0	50	0	96.2	61-131	0				
Surr: Dibromofluoromethane	49.83	0	50	0	99.7	87-126	0				
Surr: Toluene-d8	50.25	0	50	0	100	84-111	0				

QC BATCH REPORT

Environmental Quality Management

Work Order:

1609064

Project:

AKSteel ICR Project # 050074.0172

Batch ID: R132682

Instrument ID VMS1

Method: SW8260B

Client ID:	Run ID	VMS1_	160908A	SeqN	No: 1351 8	5 12 F	Prep Date: DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	45.03	5.0	50	0	90.1	40.4-134	44.22	1.82	20	
1,1-Dichloroethene	41.86	5.0	50	0	83.7	45.3-151	40.05	4.42	20	
1,2-Dichloroethane	48.84	5.0	50	0	97.7	37-139	45.82	6.38	20	
Benzene	44.22	5.0	50	0	88.4	37.4-144	43.28	2.15	20	
Carbon tetrachloride	43.26	5.0	50	0	86.5	33,8-150	43.45	0.438	20	
Chlorobenzene	44.86	5.0	50	0	89.7	52.4-132	45.3	0.976	20	
Chloroform	47.22	5.0	50	0	94.4	45.5-135	45.62	3.45	20	
Ethylbenzene	44.65	5.0	50	0	89.3	46.5-146	44.5	0.337	20	
Styrene	45.25	5.0	50	0	90.5	20.9-184	45.69	0.968	20	
Tetrachloroethene	45.27	5.0	50	0	90.5	55.2-134	45.3	0.0662	20	
Toluene	44.71	5.0	50	0	89.4	32.7-140	44.83	0.268	20	
Xylenes, Total	135.4	10	150	0	90.3	43.6-148	136.1	0.508	20	
Surr: 4-Bromofluorobenzene	47.72	0	50	0	95.4	61-131	48.11	0.814		
Surr: Dibromofluoromethane	49.88	0	50	0	99.8	87-126	49.83	0.1		
Surr: Toluene-d8	49.82	0	50	0	99.6	84-111	50.25	0.859		

The following samples were analyzed in this batch:

1609064-04A

1609064-05A

1609064-06A

QC BATCH REPORT

Environmental Quality Management

Work Order:

1609064

Project:

AKSteel ICR Project # 050074.0172

Batch ID: R132827

Instrument ID UVVIS1

Method: E316

Sample ID: MB-R132827-R132827

Units: mg/sample

Analysis Date: 9/13/2016

MBLK

Client ID:

SeqNo: 1354706

Prep Date:

DF: 1

Run ID: UVVIS1_160913B

PQL

0.0025

SPK Val

Qual

Analyte

Formaldehyde

Result

ND

SPK Ref Value

Control Limit %REC

RPD Ref Value

RPD Limit %RPD

QC BATCH REPORT

The following samples were analyzed in this batch:

1609064-01B 1609064-01A 1609064-02A 1609064-02B 1609064-03A 1609064-03B

ALS Environmental Date: 10-Oct-16

Client: Environmental Quality Management
Project: AKSteel ICR Project # 050074.0172
WorkOrder: 1609064

Environmental Quality Management
QUALIFIERS,
ACRONYMS, UNITS

Qualifier Description Value exceeds Regulatory Limit Not accredited а В Analyte detected in the associated Method Blank above the Reporting Limit E Value above quantitation range Η Analyzed outside of Holding Time Analyte detected below quantitation limit Not offered for accreditation n ND Not Detected at the Reporting Limit O Sample amount is > 4 times amount spiked P Dual Column results percent difference > 40% R RPD above laboratory control limit S Spike Recovery outside laboratory control limits U Analyzed but not detected above the MDL Description Acronym DUP Method Duplicate Ε **EPA Method** LCS Laboratory Control Sample LCSD Laboratory Control Sample Duplicate **MBLK** Method Blank MDL Method Detection Limit MQL Method Quantitation Limit MS Matrix Spike **MSD** Matrix Spike Duplicate PDS Post Digestion Spike PQL Practical Quantitaion Limit SDL Sample Detection Limit SWSW-846 Method

μg/L mg/sample Description

Units Reported

Sample Receipt Checklist

Client Name: E	QM-CINCINNATI				Date/Time	Received:	02-	Sep-16	<u> 11:30</u>			
Work Order: 16	<u>609064</u>				Received b	y;	JŅV	<u>V</u>				
Checklist complete	ed by Jan Wilcox	0)2-Sep-16	<u> </u>	Reviewed by;	Carol eSignature		•		Γ	12-Sep	
Matrices: Carrier name:	<u>Client</u>	'								'		
Shipping container	r/cooler in good condition?		Yes	✓	No 🗆	Not P	resent					
Custody seals inta	ct on shipping container/coole	er?	Yes		No 🗌	Not P	resent	✓				
Custody seals inta	ct on sample bottles?		Yes		No 🗌	Not P	resent	V				
Chain of custody p	present?		Yes	V	No 🗌							
Chain of custody s	signed when relinquished and	received?	Yes	Y	No 🗌							
Chain of custody a	agrees with sample labels?		Yes	V	No 🗆							
Samples in proper	container/bottle?		Yes	~	No 🗌							
Sample containers	intact?		Yes	y	No 🗆							
Sufficient sample v	volume for indicated test?		Yes	✓	No 🗆							
All samples receive	ed within holding time?		Yes	v	No 🗌							
Container/Temp Bl	lank temperature in complianc	e?	Yes	V	No 🗌							
Temperature(s)/Th	nermometer(s):				V-10-10-10-10-10-10-10-10-10-10-10-10-10-							
Cooler(s)/Kit(s):					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							
Water - VOA vials	have zero headspace?		Yes		No 🖾	No VOA v	ials subr	nitted	100			
Water - pH accepta	able upon receipt?		Yes		No 📓	N/A						
pH adjusted? pH adjusted by:			Yes -		No 🗵	N/A						
Login Notes:												
Client Contacted:		Date Contacted:			Person	Contacted:						
Contacted By:		Regarding:										
Comments:												
CorrectiveAction:		· · · · · · · · · · · · · · · · · · ·					~ ^ ***					
									S	RC Pa	ge 1 of	1



03-Oct-2016

Doug Allen **Environmental Quality Management** 1800 Carillon Boulevard Cincinnati, OH 45240

Tel:

(513) 825-7500

Fax: (513) 825-7495

Re: AK Middletown; Project # 050074.0172

Work Order: 1609539

Dear Doug,

ALS Environmental received 3 samples on 19-Sep-2016 04:17 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 11.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

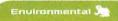
Chris Gibson

Electronically approved by: Chris Gibson

Chris Gibson

Project Manager

ADDRESS 4388 Glendale Milford Rd Cincinnati, Ohio 45242- | PHONE (513) 733-5336 | FAX (513) 733-5347 ALS GROUP USA, CORP. Part of the ALS Group. An ALS Limited Company



Date: 03-Oct-16

Client: Environmental Quality Management

Project: AK Middletown; Project # 050074.0172

Work Order: 1609539

Lab Samp II	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1609539-01	C-316-4	Impinger		9/15/2016	9/21/2016	
1609539-02	C-316-4	Impinger		9/15/2016	9/21/2016	
1609539-03	C-0031-4	Impinger		9/15/2016	9/21/2016	

ALS Environmental

Date: 03-Oct-16

Client: Environmental Quality Management

Project: AK Middletown; Project # 050074.0172 Case Narrative

Work Order: 1609539

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: 03-Oct-16

Client: Environmental Quality Management Work Order: 1609539

Project: AK Middletown; Project # 050074.0172

Lab ID: 1609539-01A **Collection Date:** 9/15/2016

Client Sample ID: C-316-4 Matrix: IMPINGER

Report Dilution

Analyses Result Qual Limit Units Factor Date Analyzed

FORMALDEHYDE EMISSIONS BY EPA 316 E316 Analyst: SBD Formaldehyde ND mg/sample 1 9/26/2016

Lab ID: 1609539-02A Collection Date: 9/15/2016

Client Sample ID: C-316-4 Matrix: IMPINGER

Report Dilution

Analyses Result Qual Limit Units Factor Date Analyzed

FORMALDEHYDE EMISSIONS BY EPA 316 E316 Analyst: SBD

FORMALDERYDE EMISSIONS BY EPA 316 E316 Analyst. SBL Formaldehyde ND mg/sample 1 9/26/2016

Note:

ALS Environmental

Date: 03-Oct-16

Client: Environmental Quality Management Work Order: 1609539

Project: AK Middletown; Project # 050074.0172

Lab ID: 1609539-03A **Collection Date:** 9/15/2016

Client Sample ID: C-0031-4 Matrix: IMPINGER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS			SW82	60B		Analyst: LAK
1,1,1-Trichloroethane	ND		5.0	µg/L	1	9/22/2016 01:44 PM
1,1,2,2-Tetrachloroethane	ND		5.0	μg/L	1	9/22/2016 01:44 PM
1,1,2-Trichloroethane	ND		5.0	μg/L	1	9/22/2016 01:44 PM
1,1-Dichloroethene	ND		5.0	μg/L	1	9/22/2016 01:44 PM
1,2-Dichloroethane	ND		5.0	μg/L	1	9/22/2016 01:44 PM
1,2-Dichloropropane	ND		5.0	μg/Ľ	1	9/22/2016 01:44 PM
Benzene	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Bromoform	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Bromomethane	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Carbon disulfide	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Carbon tetrachloride	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Chlorobenzene	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Chloroethane	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Chloroform	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Chloromethane	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Ethylbenzene	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Methylene chloride	35		5.0	μg/L	1	9/22/2016 01:44 PM
Styrene	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Tetrachloroethene	ND		5.0	μg/L	1	9/22/2016 01:44 PM
Toluene	10		5.0	μg/L	1	9/22/2016 01:44 PM
Vinyl chloride	ND		2.0	μg/L	1	9/22/2016 01:44 PM
Xylenes, Total	ND		10	µg/L	1	9/22/2016 01:44 PM
Surr: 4-Bromofluorobenzene	113		61-131	%REC	1	9/22/2016 01:44 PM
Surr: Dibromofluoromethane	102		87-126	%REC	1	9/22/2016 01:44 PM
Surr: Toluene-d8	101		84-111	%REC	1	9/22/2016 01:44 PM

Date: 03-Oct-16

QC BATCH REPORT

Client:

Environmental Quality Management

Work Order:

1609539

Project:

AK Middletown; Project # 050074.0172

Batch ID: R133126

Instrument ID VMS1

Method: SW8260B

MBLK Sample ID: MBLK-R13	3126			U	nits: µg/L		Analysi	s Date: 9/2	2/2016 11	:43 AM
Client ID:	Run I	D: VMS1 _	160922A		No: 1360 8	319	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	2.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
1,1,2-Trichloroethane	ND	2.0								
1,1-Dichloroethene	ND	2.0								
1,2-Dichlorcethane	ND	2.0								
1,2-Dichloropropane	ND	2.0								
Benzene	ND	2.0								
Bromoform	ND	2.0								
Bromomethane	ND	2.0								
Carbon disulfide	ND	2.0								
Carbon tetrachloride	ND	2.0								
Chlorobenzene	ND	2.0								
Chloroethane	ND	2.0								
Chloroform	ND	2.0								
Chloromethane	ND	2.0								
Ethylbenzene	ND	2.0								
Methylene chloride	ND	2.0								
Styrene	ND	2.0								
Tetrachloroethene	ND	2.0								
Toluene	ND	2.0								
Vinyl chloride	ND	2.0								
Xylenes, Total	ND	4.0								
Surr: 4-Bromofluorobenzene	55.88	0	50	0	112	61-131	()		
Surr: Dibromofluoromethane	51.56	0	50	0	103	87-126	()		
Surr: Toluene-d8	49.92	0	50	0	99.8	84-111	()		

Environmental Quality Management

Work Order:

1609539

Project:

AK Middletown; Project # 050074.0172

Batch ID: R133126

Instrument ID VMS1

Method: SW8260B

LCS Sample ID: LCS-R133: Client ID:		D. Maga	4600224		its: µg/L No: 13608		Analysis Date: 9/22/2016 08:11 AM Prep Date: DF: 1			
	Rulii	D: VMS1_	IDUYZZA		NO, Tabut					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value %RP	RPD Limit	Qual	
1,1,1-Trichloroethane	55.15	5.0	50	0	110	48.4-140	0			
1,1-Dichloroethene	57.39	5.0	50	0	115	45.5-150	0			
1,2-Dichloroethane	50.42	5.0	50	0	101	46.5-141	0			
Benzene	52.11	5.0	50	0	104	50.7-134	0			
Carbon tetrachloride	55.24	5.0	50	0	110	45.5-143	0			
Chlorobenzene	50.33	5.0	50	0	101	45-133	0			
Chloroform	56.28	5.0	50	0	113	52.4-136	0			
Ethylbenzene	50.65	5.0	50	0	101	37.8-145	0			
Styrene	50.6	5.0	50	0	101	26.3-172	0			
Tetrachloroethene	51.36	5.0	50	0	103	37.3-139	0			
Toluene	51.89	5.0	50	0	104	44-135	0			
Xylenes, Total	148.8	10	150	0	99.2	47.3-132	0			
Surr: 4-Bromofluorobenzene	55.83	0	50	0	112	61-131	0			
Surr: Dibromofluoromethane	53.71	0	50	0	107	87-126	0			
Surr: Toluene-d8	50.68	0	50	0	101	84-111	0			
MS Sample ID; 1609591-0*	1A MS									
Client ID:		D: VMS1 _	160922A		its: µg/L No: 1360 8	119 F	Analysis Date; ! Prep Date:	0/22/2016 0/ DF; 1	5:41 AM	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value %RP	RPD Limit	Qual	
1,1,1-Trichloroethane	51.2	5.0	50	0	102	40.4-134	0			
1,1-Dichloroethene	54.75	5.0	50	0	110	45.3-151	0			
1,2-Dichloroethane	49.06	5.0	50	0	98.1	37-139	0			
Benzene	49.38	5.0	50	0	98.8	37.4-144	0			
Carbon tetrachloride	52.17	5.0	50	0	104	33.8-150	0			
Chlorobenzene	46.33	5.0	50	0	92.7	52.4-132	0			
Chloroform	52.54	5.0	50	0	105	45,5-135	0			
Ethylbenzene	45.67	5.0	50	0	91.3	46.5-146	0			
Styrene	46.45	5.0	50	0	92.9	20.9-184	0			
Tetrachloroethene	46.95	5.0	50	0	93.9	55.2-134	0			
Toluene	48.44	5.0	50	0	96.9	32.7-140	0			
Xylenes, Total	135.1	10	150	0	90.1	43.6-148	0			
Surr: 4-Bromofluorobenzene	56.07	0	50	0	112	61-131	0			
Surr: Dibromofluoromethane	52.5	0	50 50	0	105	87-126	0			
Sunt. DIDI ONI ONI UNITEDI I AND	02.0	J	JU	U	100	07-120	U			

50

84-111

Surr: Toluene-d8

50.34

QC BATCH REPORT

Environmental Quality Management

Work Order:

1609539

Project:

AK Middletown; Project # 050074.0172

Batch ID: R133126

Instrument ID VMS1

Method: SW8260B

MSD Sample ID: 1609591-0					its: μg/L		Analysis Date: 9/22/2016 09			1 AIN
Client ID:	Runi	D: VMS1_	160922A	Seqn	lo: 1360 8	114 H	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	50.5	5.0	50	0	101	40.4-134	51.2	1.38	20	
1,1-Dichloroethene	54.19	5.0	50	0	108	45.3-151	54.75	1.03	20	
1,2-Dichloroethane	49.11	5.0	50	0	98.2	37-139	49.06	0.102	20	
Benzene	48.52	5.0	50	0	97	37.4-144	49.38	1.76	20	
Carbon tetrachloride	50.15	5.0	50	0	100	33.8-150	52.17	3.95	20	
Chlorobenzene	46.28	5.0	50	0	92.6	52.4-132	46.33	0.108	20	
Chloroform	52.63	5.0	50	0	105	45.5-135	52.54	0.171	20	
Ethylbenzene	45.48	5.0	50	0	91	46.5-146	45.67	0.417	20	
Styrene	46.51	5.0	50	0	93	20.9~184	46.45	0.129	20	
Tetrachloroethene	46.86	5.0	50	0	93.7	55.2-134	46.95	0.192	20	
Toluene	46.92	5.0	50	0	93.8	32.7-140	48.44	3.19	20	
Kylenes, Total	134.7	10	150	0	89.8	43.6-148	135.1	0.252	20	
Surr: 4-Bromofluorobenzene	54.12	0	50	0	108	61-131	56.07	3.54		
Surr: Dibromofluoromethane	53.82	0	50	0	108	87-126	52.5	2.48		
Surr: Toluene-d8	50.6	0	50	0	101	84-111	50.34	0.515		

The following samples were analyzed in this batch:

1609539-03A

QC BATCH REPORT

Environmental Quality Management

Work Order:

1609539

Project:

AK Middletown; Project # 050074.0172

Batch ID: R133217

Instrument ID UVVIS1

Method: E316

MBLK

Sample ID: MB-R133217-R133217

Units: mg/sample

Analysis Date: 9/26/2016

Client ID:

DF: 1

QC BATCH REPORT

Run ID: UVVIS1_160926B

SeqNo: 1362785

Prep Date:

Analyte

Result

SPK Ref Value

Control Limit %REC

RPD Ref Value %RPD RPD Limit Qual

Formaldehyde

ND

PQL

0

SPK Val

The following samples were analyzed in this batch:

1609539-01A 1609539-02A

Date: 03-Oct-16

ALS Environmental

Client: Environmental Quality Management **QUALIFIERS,** AK Middletown; Project # 050074.0172 Project: **ACRONYMS, UNITS**

WorkOrder: 1609539

· · · · · · · · · · · · · · · · · · ·	
Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
В	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method
Units Reported	Description

Units Reported Description

> μg/L mg/sample

Sample Receipt Checklist

Client Name: <u>EQM-CINCINNATI</u>					Date/Time Received: 19-Sep-16 16:17							
Work Order: <u>1609539</u>						Received by:			<u>H</u>			
Checklist complete		Jan Wilcox gnature		21-Sep-16 Date	3 .	Reviewed by:	Chris eSignati	Gibson 110				ep-16 rate
Matrices: Carrier name:	<u>Client</u>											
Shipping container/cooler in good condition?				Yes	V	No 🗌	Not	Present				
Custody seals intact on shipping container/cooler?			?	Yes		No 🗆	Not	Present	✓			
Custody seals intact on sample bottles?				Yes		No 🗌	Not	Present	✓			
Chain of custody present?				Yes	V	No 🗔						
Chain of custody signed when relinquished and received?			eceived?	Yes	✓	No 🗌						
Chain of custody agrees with sample labels?				Yes	V	No 🗌						
Samples in proper container/bottle?				Yes	✓	No 🗀						
Sample containers intact?				Yes	✓	No 🗌						
Sufficient sample volume for indicated test?				Yes	V	No 🗌						
All samples received within holding time?				Yes	~	No 🗌						
Container/Temp Blank temperature in compliance?			e?	Yes	~	No 🗌						
Temperature(s)/Thermometer(s):												
Cooler(s)/Kit(s):												
Water - VOA vials have zero headspace?				Yes		No 🗏	No VOA	vials subr	mitted			
Water - pH acceptable upon receipt?				Yes		No 🖾	N/A					
pH adjusted? pH adjusted by:				Yes		No 🗵	N/A	2				
Login Notes:												
	===				=							
Client Contacted: Date Contacte			Perso			n Contacted:						
Contacted By: Regarding:												
•			,									
Comments:												
CorrectiveAction:		- POW.										
										SRC	Page 1	of 1



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6 Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID:

EQM100

ALS WO#:

L1823194

Date of Sample Receipt 2-Sep-16

Date of Report 23-Sep-16

Client Name:

Environmental Quality Management Inc.

Client Address:

1800 Carillon Boulevard

Cincinnati, OH 45240

UNITED STATES

Client Contact: Doug Allen

Client Project ID: 50074.0172 AK STEEL ICR

COMMENTS:

VOCs via SW846 Method 5041A/8260B

Certified by:

Whitney Davis Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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Page 1 of 4 L1823194 VOST 160923 ALS Canada Ltd

																											% Rec	1-150	50-150 50-150	% Rec	0-200	50-200	
																											8	ភ	ភេភ	76	ស៍ដ	សីស	
		P-0031-1C (TENAX TUBE#1)	L1823194-5 16090718.D	sample 8/30/2016 #########	Conc. ug/sample	4	86.6	40.09 0.09	<0.02	<0.01 <0.01	<0.02	40.1	0,00 V	<0.01	0.610	0.05 10.05	40.01	0.242	<0.0>	0.07	50.07	0.018	0,023	<0.02	50.05 8.05	68	% Rec	-	98 18	% Rec	128	148 124	<u> </u>
		P-0031-1B (TENAX TUBE#1)	L1823194-3 16090717.D	sample 8/30/2016 9/7/2016 18:28	Conc. ug/sample		40.06 0.00	<0.0>	<0.02	0.01 0.01	<0.02	<0.1	<0.01	<0.01	0.762	<0.01	<0.01	0.238	<0.01	V 0.01	0,070	0.017	0.024	<0.02	<0.05	75	% Rec	-	97 83	% Rec	135	14/	***************************************
		P-0031-2B (TENAX TUBE#1)	L1823194-9 16090716.D	sample 8/31/2016 9/7/2016 18:02	Conc. ug/sample	,	<0.05 <0.05 <0.05	60.0>	<0.02	< 0.01	0.026	0.141	<0.01 <0.01	<0.01	1.634	<0.01	<0.01 50.01	0.326 <0.02	<0.01	<0.01 0.01	0,108	0.026	0.059	<0.02 0.02	< 0.05 % Rec	64	% Rec	102	97 83	% Rec	136	120	
		P-0031-2C (TENAX TUBE#1)	L1823194-11 16090715.D	sample 8/31/2016 9/7/2016 17:37	Conc. ug/sample		<0.08	<0.0>	<0.02	<0.01	0.022	1,00 c	<0.01	<0.01	0.316	<0.01	0.01 100	<0.02	<0.01	V0.07	0.037	<0.01	0.023	20.02 0.02	50.05 % Rec	06	% Rec	109	100 80	% Rec	135	119	
		P-0031-3C (TENAX TUBE#1)	L1823194-17 16090714.D	sample 9/1/2016 9/7/2016 17:11 9	Conc. ug/sample	, 0	<0.05 <0.02	<0.0>	<0.02	0.01 0.03	<0.02	0.131	<0.01	<0.01	0.151	<0.01	<0.01	<0.02	<0.01	0.00	<0.03	<0.01	<0.02	<0.02 0.02	<0.03	83	% Rec	110	100 81	% Rec	136	118	
ımental	nmary Report	P-0031-3B (TENAX TUBE#1)	L1823194-15 16090713.D	sample 9/1/2016 9/7/2016 16:22	Conc. ug/sample	90 01	×0.05	<0.0>	<0.02	<0.03	<0.02	<0.1 6.01	<0.01	<0.01	0.173	<0.01	<0.01	<0.02	<0.01	70.03 70.03	<0.03	<0.01	<0.02 <0.02 <0.03	0.02 2.02	<0.05	81	% Rec	106	97 83	% Rec	131	120	
ALS Environmental	Sample Analysis Summary Report VOST Tube ug/sample	P-0031-1A (TENAX TUBE#1)	L1823194-1 16090711.D	sample 8/30/2016 9/7/2016 15:31	Conc. ug/sample	90 0/	<0.02	60.0>	<0.02	<0.03	<0.02	, 00.4 1.00.4	0.05 0.05	<0.01	1.84/	<0.01	0.05 50.01	0.301 <0.02	<0.01	<0.01	0.133	0.034	0.287	<0.02 0.02	<0.05	101	% Rec	107	97 82	% Rec	128	115	
	Sample Matrix VO: Analysis Units ug/	P-0031-2A (TENAX TUBE#1)	L1823194-7 16090710.D	sample 8/31/2016 7/2016 15:06	Conc. ug/sample	. 0	<0.05	<0.0>	<0.02	<0.01	0.048	, v , v	<0.01	<0.01	0.8/2	<0.01	<0.01	<0.02	<0.01	<0.01 0.03 0.03	0.080	0.018	1.219	<0.02	√u,03	82	% Rec	109	96 80	% Rec	124	116	
		P-0031-3A (TENAX TUBE#1)	L1823194-13 16090709.D	sample 9/1/2016 9/7/2016 14:40 9,	Conc. ug/sample	900	<0.05 <0.02	<0.0>	<0.02	0.05 0.03	0.027	× 0.1	0.05	<0.01	0.318	<0.01	0.07	<0.02	<0.01	0.07	<0.03	<0.01	\$0.02 20.03	<0.02 0.02	<0.05 % Rec	81	% Rec	115	99 85 85	% Rec	120	115	F
	869	Laboratory Control Sample	250ng-controlstd 16090707.D	LCS 9/7/2016 13:23 9	% Rec	act	103	122	100	SN SN	101	68	72	119	38	111	92	76 96	105	66 G	98	86	111	65	NS No Rec	98	% Rec	105	93 92	% Rec	911	113	indicates that compound was not spiked
	MSD-3 Rxi-6245ii MS 1099869 9/7/2016	Laboratory Method Blank C	VOST-blank 2 16090708.D	Blank 9/7/2016 14:01	Conc. ug/sample	. `	√ ∨	· v	v '	v v	· v	V 1	<i>,</i> ,	v	V V	v	V۱	<i>,</i> ,	v	V \	/ v	٧	v v	v '	% Rec	87	% Rec	117	96 88	% Rec	119	121	indicates that comp
	உயரை			U1	RL ug/sample	. 500	0.00	0.09	0.02	0.03	0.02	1.0	0.01	0.01	0.02	0.01	0.0	0.02	0.01	0.01	0.03	0.01	70.0	0.02	n 0 0								
	Instrument Column Acquisition Start Date	Client Sample ID	ALS Sample ID Filename	Sampling date Acquisition Time	Target Analyte ug	or ettemore de	Vinyl Chloride	Bromomethane	Chloroethane	1,1-Dichloroethene Iodomethane	Carbon disulfide	Methylene Chloride	1,1,1-Trichloroethane	Carbon Tetrachloride	Benzene	Trichloroethene	1,2-Dichloropropane	1.1.2-Trichloroethane	Tetrachloroethene	Chlorobenzene	M&P-Xylene	0-Xylene	Styrene	1,1,2,2-Tetrachloroethane	Acrylonicale Field Standard	d10-Ethylbenzene	Surrogate Standards	d4-1,2-Dichloroethane	d8-Toluene 4-Bromofluorobenzene	Internal Standards	Bromochloromethane	1,4-Dittorrobenzene d5-Chlorobenzene	. SZ

Client Simple DD Client Simp				AL	ALS Environmental	ental				
Frace-Scale in S. 100000000 Frace-Scale in S. 100000000 Frace-Scale in S. 100000000 Frace-Scale in S. 100000000 Frace-Scale in S. 1000000000 Frace-Scale in S. 1000000000000 Frace-Scale in S. 100000000000000000000000000000000000	Toetrumoent	ς- - - - - - - - - - - - - - - - - - -		Sample	Analysis Summa	ry Report				THE PARTY OF THE P
This control Sample Telegraphy Telegra	instrument Column Acquísitíon Start Date	MSD-3 RXI-624SII MS 10 9/9/2016	698660			VOST Tube ug/sample				
No.27-5-6	Client Sample ID	Laboratory Method Blank	iaboratory Control Sample	P-0031-1C (TENAX TUBE#2 + ANASORB 747)	P-0031-1B (TENAX TUBE#2 + ANASORB 747)	P-0031-2B (TENAX TUBE#2 + ANASORB 747)	P-0031-2C (TENAX TUBE#2 + ANASORB 747)	P-0031-3B (TENAX TUBE#2 + ANASORB 747)	P-0031-3C (TENAX TUBE#2 + ANASORB 747)	Recovery Limits
H. Charles (1975)	ALS Sample ID Filename	VOST-blank 16090907.D	2501	L1823194-6 16090908.D	L1823194-4 16090909.D	L1823194-10 16090910.D	L1823194-12 16090911.D	L1823194-16 16090912.D	L1823194-18 16090913.D	
Marie Mar	Sampling date Acquisition Time	Blank 9/9/2016 15:59	LCS 9/9/2016 14:13	sample 8/30/2016 9/9/2016 16:47	8/3 9/9/2016	sample 8/31/2016 9/9/2016 17:38		sample 9/1/2016 9/9/2016 18:29	sample 9/1/2016 9/9/2016 18:54	
0.00	Target Analyte ug		% Rec	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	No.
Color Colo	Chloromethane		115	<0.06	40.05 60.05	0.114	<0.06 0.06	<0.06	<0.06	
0.02 < 0.02 < 0.02 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0.002 < 0	Bromomethane			<0.0>	<0.0>	<0.02 <0.09	<0.02	<0.02	<0.0>	
0.02	Chloroethane 1.1-Dichloroethene			<0.02 <0.01	<0.02	<0.02	<0.02	<0.02 <0.02	<0.02	
Color Colo	Iodomethane		,	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
0.01	Carbon disumbe Methylene Chloride			<0.02 0.174	<0.02 0.127	0.020	<0.02 <0.1	<0.02 <0.1	<0.02 <0.1	
Control Cont	Chloroform 1.1.1-Trichlomethane		,	\ 0.01	0.07	< 0.01	V 40.01	<0.01	<0.01	
0.05 < < 87	Carbon Tetrachloride			4 < 0.01	<0.01	<0.01	<0.01	<0.01 <0.01	<0.01	
0.01	Benzene 1.2-Dichloroethane			0.158 <0.01	0.171	0.053	0.071	< 0.05	×0.05	
0.01 < 92	Trichloroethene			<0.01	<0.01	<0.01	×0.01	<0.0>	×0.01	
0.01	1,2-Dichloropropane Toluene			<0.01 <0.05	<0.01 <0.05	<0.01	*0.01 *0.05	<0.01 <0.05	<a>0.01	
Court Cour	1,1,2-Trichloroethane			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
0.01 < 91 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02 < 0.02	Chlorobenzene			<0.01 <0.01	<0.01 <0.01	0.05 0.02	<0.01 <0.01	<0.01 <0.01	* 0.01 * 0.01	
0.013 </td <td>Ethylbenzene</td> <td></td> <td></td> <td><0.01 50.01</td> <td><0.01 0.01</td> <td><0.01</td> <td><0.01</td> <td><0.01</td> <td><0.01</td> <td></td>	Ethylbenzene			<0.01 50.01	<0.01 0.01	<0.01	<0.01	<0.01	<0.01	
0.02 < 9 1	O-Xylene			<0.03	<0.03	<0.03	<0.03	0.03 0.01	<0.03 <0.03	
Control Cont	Styrene			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
% Rec % Rec <th< td=""><td>1,1,2,2-Tetrachloroethane</td><td></td><td></td><td></td><td>0.02</td><td>20:01 20:02 70:02</td><td>\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \</td><td>CD:02 CD:03 CD:04 CD:05 CD</td><td>0.02 0.02 0.02</td><td></td></th<>	1,1,2,2-Tetrachloroethane				0.02	20:01 20:02 70:02	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	CD:02 CD:03 CD:04 CD:05 CD	0.02 0.02 0.02	
96/8 Rec	Field Standard		% Rec	% Rec	% Rec	% R ec	% Rec	% Rec	% Rec	
96 Rec 97 Intervention was not spiked 111 Intervention 112 Intervention 114 Intervention 117 Intervention 118 Intervention 118 Intervention 119 Intervention 110 Intervention 96 Rec 96 Into 117 Into 117 Into 116 Into 117 Into 117 Into 117 Into 118 Into 117 Into 117 Into 118 Into 117 Into 117 Into 118 Into <td>d10-Ethylbenzene</td> <td>107</td> <td>108</td> <td>NS</td> <td>NS</td> <td>NS</td> <td>NS</td> <td>SN</td> <td>NS</td> <td></td>	d10-Ethylbenzene	107	108	NS	NS	NS	NS	SN	NS	
113 95 111 114 117 110 112 114 97 96 107 102 104 106 100 100 90 103 82 84 82 87 93 91 90 103 103 108 106 100 100 100 112 111 121 112 112 116 104 104 117 101 96 92 93 99 100 indicates that compound was not spiked	Surrogate Standards	% Rec	%		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
97 90 103 84 104 100 100 100 100 100 100 100 100 10	d4~1,2~Dichloroethane	113	95	111	411	117	110	112	114	50-150
% Rec % Rec <th< td=""><td>4-Bromofluorobenzene</td><td>06</td><td>г</td><td>82</td><td>84</td><td>82</td><td>87</td><td>93</td><td>91</td><td>50-150</td></th<>	4-Bromofluorobenzene	06	г	82	84	82	87	93	91	50-150
128 111 121 117 116 117 117 116 117 117 116 117 117	Internal Standards	% Rec	% Rec		% Rec		% Rec		% Rec	% Rec
indicates that compound	1,4-Difluorobenzene	128		121 96	112	117	116	116 99	117	50-200 50-200 50-200
	SN	indicates that co		pa						

ā	660	Sample Analysis 1869 Laboratory Control Sample 250ng-controlstd 16090206.D LCS 9/2/2016 14:47 % Rec 58 44 99 84 84 84 84 84 84 84 84	Sample Analysis Summary Report	Sample Matrix Analysis Units P-D031-1A (TENAX TUBE#2 + ANASORB 747) L1823194-2 16090210.D sample 8/30/2016 9/2/2016 17:53 Conc. ug/sample <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.009 <0.0	VOST Tube ug/sample P-0031- (TENAX TU + ANASC 747) L1823 16090 8 8 8 8/31 9/2/2016	Recovery
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972/		250ng-controlstd 16090206.D 1CS 9/2/2016 14:47 % Rec 58 84 94 94 94 94 94 94 94 94 94 94 94 94 94	1.1823.194-1.4 16090209.D sample 9/1/2016 9/2/2016 17:27 Conc. ug/sample <0.002 <0.002 <0.003 <0.003 <0.002 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003	L1823194-2 16090210.D sample 8/30/2016 9/2/2016 17:53 Conc. ug/sample <0.09 <0.02 <0.03 <0.02 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0	L1823194-8 16090211.D sample 8/31/2016 8/31/2016 8/31/2016 6.0.02 6.0.02 6.0.02 6.0.03 6.0.01 6.0.01	
ā	Błank 16. 16:15 Conc. Sample	LCS 9/2/2016 14:47 % Rec 58 58 98 98 84 84 84	sample 9/1/2016 17:27 Conc. ug/sample C005 C005 C005 C009 C000 C000 C000 C000	sample 8/30/2016 9/2/2016 17:53 Conc. ug/sample <0.05 <0.02 <0.02 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03	sample 8/31/2016 8/31/2016 9/2/2016 18:18 Conc. ug/sample <0.00 <0.00 <0.00 <0.01 <0.01 <0.01 <0.03	
ā	16 16:15 Conc. Sample Conc. Conc.	9/2/2016 14:47 % Rec 58 44 94 84 72 72 84 84	9/1/2016 9/2/2016 17:27 conc. ug/sample <0.02 <0.02 <0.03 <0.01 <0.01 <0.01 <0.01 <0.01	8/39/2016 9/2/2016 17:53 conc. ug/sample c0.05 c0.09 c0.09 c0.01 c0.03 c0.03	8/31/2016 8/31/2016 8/31/2016 18:18 Conc. ug/sample <0.02 <0.02 <0.03 <0.03 0.023 0.023 <0.01	
	Conc. sample	% Rec 58 44 98 84 72 72 85 84	Conc. ug/sample <0.06 <0.02 <0.03 <0.03 <0.01 <0.01 <0.01 <0.02 <0.01 <0.01 <0.02	Conc. ug/sample <0.06 <0.02 <0.03 <0.01 <0.03 <0.03	Conc. ug/sample <0.06 <0.02 <0.03 <0.01 <0.01 <0.03 <0.03 <0.04 <0.04 <0.05	
nple	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	8 4 4 4 8 8 8 4 4 4 8 8 8 8 8 8 8 8 8 8	60.06 60.02 60.03 60.03 60.01 60.02 60.02 60.01	60.02 60.03 60.03 60.02 60.03 60.01 60.03	 60.06 60.09 60.03 60.01 60.03 60.03 60.01 60.01 	
Chloromethane 0.06	/ V V V V	94 98 72 72 84 84	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	60.02 60.03 60.03 60.03 60.03	60.02 60.03 60.01 60.01 60.03 60.03 60.01	
	v v v v	84 72 NS 84	<pre><0.02 <0.03 <0.03 <0.03 <0.02 <0.04 <0.04 </pre>	0.02 0.03 0.03 0.03 0.03	60.02 60.03 60.03 60.03 60.03	
	V V V	72 NS 84	<pre></pre>	< < 0.01 < < 0.03 < < 0.02 < < 0.02 < < 0.02	<pre></pre>	
	v v	84 84	<pre><0.03 <0.02 <0.04 <0.04 </pre>	<0.03 <0.02	60.0360.0160.0160.01	
Lodometnane U.U.3 Carbon disulfide 0.02	,	1	20.07 40.01	70.07	40.02 <0.01 <0.01	
	ν	88	<0.01	7'0V	<0.01	
	v	93	100	<0.01	70 01	
1,1,1–Trichloroethane 0.01 Carbon Tetrachloride 0.01	V 1	112	40.01 40.01	0.07 60.04	<0.01	
	/ V	68	<0.05	50.01	50.01 0.062	
	٧	103	<0.01	<0.01	<0.01	
1.2-Dichloropropane 0.01	v v	107	<0.01 <0.01	40.01		
Toluene 0,05	v	121	<0.05	<0.05	<0.05	
	v	132	<0.02	<0.02	<0.02	
Chlorobenzene 0.01	v v	132	0.01	V0.01	50.0	
	v	122	<0.01	<0.07	<0.01	
	V	123	<0.03	<0.03	<0.03	
Chyene 0.01	v \	121	10.07	, vo.01	<0.01	
	/ V	124	<0.02	×0.02	< 0.02	
	' v	98	<0.02	<0.02	<0.02	
	v	SN	<0.05	<0.05	<0.05	
Field Standard	% Rec	% Rec	% Rec	% Rec	% Rec	
d10-Ethylbenzene	108	113	SN	NS	NS	
Surrogate Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d4-1,2-Dichloroethane	86	46	102	103	104	50-150
d8-Toluene 4-Bromofluorobenzene	112	114	118	118	115	50-150
	3 2	2 6	2 4			UCT-UC
	70 KeC 114	70 Ket	% Kec	% Kec 111	% Rec	% Kec
1,4-Difluorobenzene d5-Chlorobenzene	139	96 89	136	124	128	50-200



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6 Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID: EQM100

ALS WO#: L1826815

Date of Report 26-Sep-16

Date of Sample Receipt 9-Sep-16

Client Name:

Environmental Quality Management Inc.

Client Address:

1800 Carillon Boulevard

Cincinnati, OH 45240

United States

Client Contact: Doug Allen

Client Project ID: 50074.0172 AK Steel ICR

COMMENTS:

VOCs via SW846 Method 5041A/8260B

NS = Not spiked

E = Estimated value. Instrument response exceeds instrument calibration range of 2.0 ug.

Ketone data by VOST analyses are estimated values only

Data are presented in sequence of run date and then in sequence of instrumental analysis. This order is provided in order to assist any evaluation and concerns on carry-over from injection to injection.

The first tenax trap was run separately from the second tenax plus the anasorb 747. Ethylbenzene-d10 was spiked into the first tenax trap prior to sampling. Recovery of Ethylbenzene-d10 has been reported from these first tenax traps.

After analysis of a selection of three first tenax traps, the levels of benzene were found to be above the instrument calibration range of 2ug per sample. Therefore all other first tenax traps were analyzed via a modified method where the sample tubes were desorbed through the aqueous purge and into air bags. A 1/20th sub-sample from the air bags was injected and thereby analyzing the equivalence of a 20-fold dilution.

Acrylonitrile was not in the normal multi-point calibrations. Therefore a daily low standard (50ng) was analyzed at the reporting limit as provided. No acrylonitrile was observed in any of the samples.

1,1,1-Trichloroethane recovery is below the normal control limits on the Sept 15th run date only. This target was not observed in any of the samples and therefore no negative impact to data quality is anticipated from this QC criterion excedence.

R. McLeod 26-Sep-16

Certified by

Whitney Davis Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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					ALS Envi	ALS Environmental					
Instrument Column	M W W	MSD-3 Rxi-624Slf MS 1360231	.0231		Sample Analysis Sample Matrix Analysis Units	Sample Analysis Summary Report Sample Matrix VOST Tube Analysis Units ug/sample			***************************************		
Acquisition Start Date	/6	9/14/2016									
Client Sample ID	Σ	Laboratory Method Blank	Laboratory Control Sample	C-0031-1A (TENAX TUBE#2 + ANASORB	C-0031-1C (TENAX TUBE#2 + ANASORB 747)	C-0031-1B (TENAX TUBE#2 + ANASORB 747)	C-0031-1D (TENAX TUBE#2 + ANASORB 747)	C-0031-1E (TENAX TUBE#2 + ANASORB	C-0031-1F (TENAX TUBE#2 + ANASORB	C-0031-2A (TENAX TUBE#2 + ANASORB	C-0031-2B (TENAX TUBE#2 + ANASORB 747)
ALS Sample ID Filename		VOST-blank 16091408.D	250ng-Controlstd 16091407.D	L1826815-2 16091409.D	L1826815-6 16091410.D	L1826815-4 16091411.D	L1826815-8 16091412.D	L1826815-10 16091413.D	L1826815-12 16091414.D	11826815-14 16091415.D	L1826815-16 16091416.D
Dilution Factor Sampling date Acquisition Time		1 9/14/2016 14:23	1 9/14/2016 13:45	1 9/8/2016 9/14/2016 15:02	1 9/8/2016 9/14/2016 15:27	1 9/8/2016 9/14/2016 16:21	1 9/8/2016 9/14/2016 16:46	1 9/2/2016 9/14/2016 17:11	1 9/8/2016 9/14/2016	1 9/8/2016 9/14/2015 18:02	1 9/8/2016 9/14/2016 18:28
Target RL Analyte ug/sample	RL /sample	Conc. ug/sample	% Rec	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample
Chloromethane Viryl Chloride	0.06	V V	122	<0.06	<0.06 <0.02 <0.02	>0.06	<0.05	<0.06	<0.06	<0.06	<0.05
Bromomethane	0.09	′ ∨	102	60.09	60.0>	0.00	0.00	00.0>	60.0>	60.09	00.00
Chloroethane 1.1-Dichloroethene	0.02 0.01	v v	105	40.02 40.01	<0.02 <0.01	<0.02	<0.02	<0.02 <0.01	<0.02	<0.02 <0.02 <0.01	<0.02 <0.01
Iodomethane	0.03	V V	NS 101	A 0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Methylene Chloride	0.1	/ V	56	× 0.1	40.1	×0.1	×0.1	×0.1	× 0.1	0.181	0 V V
Chloroform 1.1.1-Trirbloroethane	0.01	v v	103	0.01 0.01	<0.01 <0.01	<0.01	0.01 0.01	<0.01 <0.01	0.01 0.01	<0.01 <0.01	<0.01 <0.01
Carbon Tetrachloride	0.01	V \	101	<0.01	<0.01 0.659	0.01 0.05	<0.01 461	>0.01	<0.01 0.409	<0.01	<0.01
1,2-Dichloroethane	0.01	′ v	95	<0.01	×0.01	0.01 0.01	0.07	<0.01	0.07 0.01	0.01 1.00	0.05
Trichloroethene 1,2-Dichloropropane	0.01	v v	101	<0.01 <0.01	0.01 0.01	<0.01 <0.01	< 0.01 < 0.01	<0.01 <0.01	0.01 0.01	<0.01 <0.01	<0.01 <0.01
Toluene	0.05	V \	115	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	0.134	0,235	0.064	<0.05	0.062	0.064	<0.05 0.05 0.05 0.05
Tetrachloroethene	0.01	/ V	118	<0.01	0.07 0.01	<0.01	<0.01	<0.07	<0.01	<0.01	<0.01
Chlorobenzene	0.01	v v	120	<0.01 <0.01	0.01 0.01	0.07 0.01	0.01 0.01	0.07 0.01 0.01	<0.01 <0.01	<0.01 <0.01 <0.01	<0.01 <0.01
M&P-Xylene	0.03	· v	115	×0.03	<0.03	0.049	<0.03	<0.03 5.03	0.03 0.03	<0.03	<0.03
O-Xylene Styrene	0.01	v v	115	<0.01 <0.02	<0.01 <0.02	0.014 <0.02	<0.02	<0.01 <0.02	<0.02	<0.02	<0.01
Bromoform	0.01	v '	130	<0.01	<0.01	<0.01	0.07 0.04	0.07 0.03	4.00 kg	0.07	0.01 0.01
1,1,2,2-1etrachioroethane Acrylonitrile	0.05	v v	NS NS	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Field Standard		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d10-Ethy(benzene		118	125	NS.	NS	SN	SN	SN	NS	SN	NS
Surrogate Standards		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d4-1,2-Dichloroethane		130	98	115	114	112	115	112 128	116	115	114
4-Bromofluorobenzene		83	96	78	18	08	81	78	08	107	82
Internal Standards		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
Bromochloromethane 1,4-Diffuorobenzene		65 72 65	122	133	126	130	126	133	136	130	132
anazino lon longuario		8	\ -	777		104					

					ALS Environmental	onmental					
					Sample Analysis Summary Report	Summary Report					
Instrument Column Acquisition Start Date	Σ H Q	MSD-3 RXI-624SII MS 1360231 9/19/2016	0231		Sample Matrix V Analysis Units u	VOST Tube ug/sample					
Client Sample ID		Laboratory Method Blank	Laboratory Control Sample	BLANK (TENAX TUBE#1)	C-0031-2B (TENAX TUBE#1)	C-0031-2C (TENAX TUBE#1)	C-0031-1B (TENAX TUBE#1)	C-0031-1C (TENAX TUBE#1)	C-0031-3D (TENAX TUBE#1)	C-0031-3E (TENAX TUBE#1)	C-0031-3F (TENAX TUBE#1)
ALS Sample ID Filename		VOST blank 2 16091908.D	250ng-Control std 16091907.D	L1826815-37 16091909.D	L1826815-15 16091910.D	L1826815-17 16091911.D	L1826815-3 16091912.D	L1826815-5 16091913,D	L1826815-31 16091914,D	11826815-33 16091915.D	L1826815-35 16091916.D
Dilution Factor Sampling date Acquisition Time		1 9/19/2016 16:35	1 9/19/2016 15:50	1 9/8/2016 9/19/2016 17:00	20 9/8/2016 9/19/2016 17:26	20 9/8/2016 9/19/2016 17:51	20 9/8/2016 9/19/2016 18:16	20 9/8/2016 9/19/2015 18:42	20 9/8/2016 9/19/2016 19:07	20 9/8/2016 9/19/2016 19:33	20 9/8/2016 9/19/2016 19:58
Target RL Analyte ug/sample	RL /sample	Conc. ug/sample	% Rec	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample
Chloromethane	0.06	V	148	<0,06	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
	0.02	٧	92	<0.02	4.0>	<0>4.0>	4.0>	4.0>	4.0>	4.0	4.0×
Bromomethane	60.0	V V	888	0.09 0.09	×1.8	8.1.5	N V	A. C.	8.1.8	8.10	8102
	0.02	/ V	06	<0.07	<0.2 <0.2	<0.5 <0.5	×0.2	<0.2	<0.3	<0.2	<0.2
	0.03	v	SN	<0.03	×0.6	<0.6 6.6	<0.6	<0.6	9.0>	0°0.6	0°.6
Carbon disultide	0.02	V \	105	>0.02 >0.02	4:00	4.02	4:02	4.00	4.0.4	4.00	4.00
	0.01	/ V	, E8	<0.01	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2 20.2
	0.01	٧	107	<0.01	<0.2	20 2	<0.2	<0.2	<0.2	Q0.5	0.2
Carbon Tetrachloride (0.01	V V	107	<0.03 <0.05	20.2 2.57	7 0 V	3 0.2	<0.2 2.71	3.05	3.31	3.79
	0.01	' V	102	<0.01	<0.2	<0.2	<0.5	V 0.2	<0.5 <0.5	40.2	<0.5
	0.01	V '	113	0 0 0 0 0	<0.2	V 0.2	707	V 0.2	V0.2	V V	7.0°
1,2-Dichloropropane (0.01	v v	115 93	40,05 0,05	7.7 ↑	1.06	, r	70.7	7.07	7.0.7 V 1	₹ ₹
	0.02	v	6	<0.02	4.0>	4.0	4.0	40.4	4.0>	4.0>	4.0
Tetrachloroethene	D.01	v \	83 83 83	0.07	<0.2	<0.5 <0.2 <0.2	0 V	<0.2 <0.2	<0.2	<0.2 <0.2 <0.2	<0.02 <0.02 <0.02
	0.0	/ V	0.6	<0.01	\$0.5 20.5	V0.2	<0.2	<0.2	<0.2	00.2	0.0
M&P-Xylene	0.03	V	26. 25.44	<0.03 <0.03	00.6 00.5	<0.70 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.00 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.20 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00 <0.00	<0.05 <0.25 <0.25	00.8 V0.5	<0.0 <0.0 <0.2	9.00 V V	40.6 40.5
	0.02	v	48	<0.02	4.0	4.0	4.00	4.0	4.0	4.0	4.0
1,1,2,2-Tetrachloroethane	0.02	V V \	ο φ ψ 6 & 2	0.02	, , , , , , , , , , , , , , , , , , ,		7.00 7.00 7.00 7.00	4.00	0.4 7.0.4	4.0 4.0	4.00 4.10
		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d10-Ethylbenzene		6 6	66	112	95	126	100	100	20	92	70
Surrogate Standards		% Rec	% Rec	% Rec	% R ec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d4-1,2-Dichloroethane		115	96	117	114	118	117	117	116	120	123
d8-Toluene 4-Bromofluorobenzene		100 96	97 104	106 90	8 60 8 21 8 21	101 93	100	101 83	100 90	101 91	76 66
Internal Standards		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
Bromochloromethane		110	112	108	90	100	100	98	101	98 114	97 108
d5-Chlorobenzene		108	102	93	68	06	96	96	95	94	94

					ALS Environmental	onmental					
			A THE PARTY OF THE		Sample Analysis Summary Report	Summary Report	***************************************				
Instrument Column Acquisition Start Date		MSD-3 Rxi-624Sil MS 1360231 9/20/2016	60231		Sample Matrix V Analysis Units u	VOST Tube ug/sample					
Client Sample ID		Laboratory Method Blank	Laboratory Controi Sample	C-0031-3C (TENAX TUBE#1)	C-0031-2D (TENAX TUBE#1)	C-0031-3A (TENAX TUBE#1)	C-0031-3B (TENAX TUBE#1)	C-0031-1E (TENAX TUBE#1)	C-0031-2E (TENAX TUBE#1)	C-0031-2F (TENAX TUBE#1)	C-0031-1F (TENAX TUBE#1)
ALS Sample ID Filename		Vost blank 16092007.D	250ng-Controlstd 16092006.D	L1826815-29 16092008.D	L1826815-19 16092009.D	L1826815-25 16092010.D	L1826815-27 16092011.D	L1826815-9 16092012.D	L1826815-21 16092013.D	L1826815-23 16092014.D	L1826815-11 16092015.D
Dilution Factor Sampling date Acquisition Time		1 9/20/2016 14:25	1 9/20/2016 13:44	20 9/8/2016 9/20/2016 15:09	20 9/8/2016 9/20/2015 15:34	20 9/8/2016 9/20/2016 16:00	20 9/20/2016 9/20/2016 16:25	20 9/20/2016 9/20/2016 16:50	20 9/8/2016 9/20/2016 17:16	20 9/8/2016 9/20/2015 17:41	20 9/8/2016 9/20/2015 18:07
Target RL Analyte ug/sample	RL g/sample	Conc. ug/sample	% R ec	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample
Chloromethane	90.0	٧	114	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Vinyl Chloride	0.02	V \	68 A	4.0 4.0 4.0	A.0.	Λ / 4.0 /	A. 00.	4.02	^ / 6 / 4. a	Λ . 4.0 .	A .0 .4
Chloroethane	0.02	′ V	91	<0.4	<0.0×	4.0×	4.0×	4.0	4.0	4.0×	4.0
1,1-Dichloroethene	0.01	V '	08°;	<0.2	<0.2	<0.2	×0.2	<0.2	<0.2	7.00	<0.2
sodomethane Carbon disulfide	0.03	v v	NS 81	<0.5 <0.4	0.0 4.0.6	0.0 4.0 4.0	40.6 40.6	0.0 0.4	^ ^ 6.6	0 0 0 4	0.0 6.4
Methylene Chloride	0.1	v	158 80	<2	27	<2	<2	< > .	77	7	7
Chloroform 1.1.1-Trichloroethane	0.01	v v	71 95	<0.2	00.2 00.2 00.2	V V	V V	<0.2 <0.2 <0.2	×0.2 ×0.2 ×0.3	V V V	<0.2 <0.2 <0.2
Carbon Tetrachloride	0.01	V	115	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzene 1 2-Dichloroothane	9.0	VV	107	3,63	3.13	3.48	2.18	3,98	3.48	3.10	2.63
Trichloroethene	0.01	′ ∨	118	<0.2	<0.2	<0.2	<0.2 0.2	<0.2	<0.2	<0.2	<0.2 40.2
1,2-Dichloropropane	0.0 10.0	V 1	113	<0.2	<0.2	<0.2	V0.2	<0.2	<0.2	<0.2	<0.2
1.1.2-Trichloroethane	0.03	v v	88	^0.4 4.0	<0.4	<0.4	<0×	^ 0 4:0	, 0 4.0 4.0	↑ 0.0	0 > 04.0 > 0
Tetrachloroethene	0.01	v	88	<0°2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5 0.5
Chlorobenzene	0.0	V 1	15.00	V 0.2	V 00.2	V 0.2	V 0.2	0.5 0.5	<0.2 70.2	7 0°7	0 0
M&P-Xylene	0.03	/ V	92	× 70.4 × 0.6	V V V	× × × × × × × × × × × × × × × × × × ×	×0.6 ×0.6	40.6 0.6	× 0.0 20.0 20.0 20.0	<0.0 <0.6 <0.6	7.0.V 9.0V
O-Xylene	D.04	V '	91	V V	00.5	× 0.2	0.5 7	<0.2	<0.2	<0.5 2.0.2	0°25
Bromoform	0.07	v v	73	V V	<0.5 <0.2 <0.2	<0.5 <0.2	<0.7 <0.2	<0.5 <0.2	<0.5 <0.2	A A A 4.0.4	50.5 4.05
1,1,2,2-Tetrachloroethane Acrylonitrile	0.02	VV	68 NS	60.4 4.1∆	4.0 4.1	4.0> 1.1	4.0 4.1	<0.4 <1	<0.4 1.2	<0.4 <1	4.0> 4.1
Field Standard		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d10-Ethylbenzene		81	83	100	114	105	109	72	106	105	135
Surrogate Standards		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d4-1,2-Dichloroethane		114	91	119	117	117	118	116	114	120	119
d8-Toluene 4-Bromofluorobenzene		98	93	111 87	101 87	106 74	55 66	98 16	108	104 95	104 94
Internal Standards		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
Bromochloromethane 1,4-Difluorobenzene		102	100 86	8 G I	97 103	105 113	97 103	95	119	102 105	ያ ው ያ
ds-Chlorobenzene		101	ກສ	د/	CO	76	/8	ά2 α2	104	83	٥/

										<u>.</u>							J 00	4.01		,	,,,	,.	MIC IC	0.000
			C-D031-3F (TENAX TUBE#2 + ANASORB 747)	L1826815-36 16091519.D	1 9/8/2016 9/15/2016 20;33	Conc. ug/sample	<0.06	<0.09 <0.02 <0.02	<0.03	<0.02	7000	0.07	10,02	10.00	20,02	500	0.00	0.02	<0.02 <0.05 <0.05	% Rec	NS	% Rec	108 106 85	% Rec 103 119 107
			C-0031-3£ (TENAX TUBE#2 + ANASORB 747)	L1826815-34 16091518.D	1 9/8/2016 9/15/2016 20:08	Conc. ug/sample	<0.06	40.09 40.02	0.03	50.05 1.02	900	40.01 40.01	20.07	0.01	<0.02 <0.02	0.00	0.00	0.02	<0.02 <0.05 <0.05	% Rec	SN	% Rec	104 104 85	% Rec 106 125 115
			C-0031-3D (TENAX TUBE#2 + ANASORB 747)	L1826815-32 16091517,D	1 9/8/2016 9/15/2016 19:43	Conc. ug/sample	<0.06 <0.02	<0.09 <0.02 <0.02	<0.03 <0.03	<0.02	0.0	0.00	0.07	40.01 40.01	<0.05	0.00	0.02	9 6 6	00 05 00 05 00 05	% Rec	NS	% Rec	106 106 85	% Rec 100 122 111
			C-0031-3C (TENAX TUBE#2 + ANASORB 747)	L1826815-30 16091516,D	1 9/8/2016 9/15/2016 19:17	Conc. ug/sample	<0.06	<0.09 <0.02 <0.02	<0.03	<0.02	1000	AD:01	0.00	0.07	40.02 40.02	0.07	0.03	40.02 40.02 40.02	0.02 0.05 0.05	% Rec	SN	% Rec	108 107 86	% Rec 98 116
			C-0031-3B (TENAX TUBE#2 + ANASORB 747)	L1826815-28 16091515.D	1 9/8/2016 9/15/2016 18:52	Conc. ug/sample	<0.06	<0.09 <0.02	<0,01	<0.02	1000	0.01	0.00	0.07 0.00 0.01	40.02 40.02	10.00	0.02	<0.02 <0.02 <0.03	<0.02 <0.05 <0.05	% Rec	SN	% Rec	108 106 84	% Rec 107 123 112
			C-0031-3A (TENAX TUBE#2 + ANASORB 747)	1,1826815-26 16091514.D	1 9/8/2016 9/15/2016 18:27	Conc. ug/sample	<0.06	<0.09 <0.02	<0.01	<0.02	100	16. 16.	100	0.00	40.05 40.02	500	58.5	6,6,6	<0.02	% Rec	SN	% Rec	102 102 96	% Rec 103 118 113
intal	y Report		C-0031-2F (TENAX TUBE#2 + ANASORB 747)	11826815-24 16091513.D	1 9/8/2016 9/15/2016 18:01	Conc. ug/sample	<0.06	<0.09 <0.02	<0.01 <0.03	<0.02	10.00	0.01	10.0	0.07 0.01	40.02 40.02	5000	0.00	0.022	<0.02	% Rec	SN	% Rec	109 107 18	% Rec 99 116 105
ALS Environmental	Sample Analysis Summary Report		C-0031-2E (TENAX TUBE#2 + ANASORB 747)	L1826815-22 16091512.D	1 9/8/2016 9/15/2016 17:36	Conc. ug/sample	<0.06	<0.09 <0.02 <0.02	<0.01 <0.03	<0.02	10.02	0.00	0.00	4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	\$0.05 \$0.05 \$0.05	500	180 S	0.00	<0.02 0.05 0.05	% Rec	NS	% Rec	110 108 85	% Rec 98 113 101
AL	Sample	OST Tube g/sample	C-0031-2D (TENAX TUBE#2 + ANASORB 747)	L1826815-20 16091511.D	1 9/8/2016 9/15/2016 17:11	Conc. ug/sample	<0.06	<0.09 <0.02	<0.01 <0.03	<0.02	20.02	<0.01 C0.01	0.07	0.07	0.02	500	7000 7000 7000 7000 7000	0000	<0.02 <0.05 <0.05	% Rec	NS	% Rec	107 104 96	% Rec 99 116 110
		Sample Matrix VOST Tube Analysis Units ug/sample	C-0031-2C (TENAX (' TUBE#2 + ANASORB 747)	L1826815-18 16091510.D	1 9/8/2016 9/15/2016 16:45	Conc. ug/sample	<0.06	<0.09 <0.02	<0.03	<0.02	0.00	0.01 0.01	0.00	<0.01 <0.01	<0.00 <0.02	500	0.01 0.01 0.01	0.026	<0.02 <0.05 <0.05	% Rec	SN	% Rec	106 107 89	% Rec 94 112 100
				L1826815-38 16091509.D	1 9/8/2016 9/15/2016 16:20	Conc. ug/sample	<0.05	<0.09 <0.02	<0.01 <0.03	<0.02	900	0.6	999	0.00	<0.05 <0.02	0.00	500	0,02	<0.02	% Rec	SN	% Rec	109 107 86	% Rec 98 112 102
		231	Laboratory BLANK (TENAX) TUBE#2 + Control Sample ANASORB 747)	250ng-controlstd 16091507.D	1 9/15/2016 14:06	% Rec	83	56 83	95 NS	92	82	100	200	1 88	104	100	969	3 & E	S 105	% Rec	117	% Rec	80 97 113	9% Rec 94 89 93
		MSD-3 Rxf-624Sl} MS 1360231 9/15/2016	Laboratory Method Blank	VOST-blank 16091508.D	1 9/15/2016 15:14	Conc. ug/sample	vv	VV	vV	V \	/ V V	/ V 1	/ V ¹	V V '	v v	v v	y	/ V V	/ V V	% Rec	105	% Rec	105 105 92	% Rec 106 126 121
		- 3.				RL 1/sample	0.06	0.09	0.01	0.02	10.0	10.0	10.0	10.0	0.03	000	500	0.02	0.02					
		Instrument Column Acquisition Start Date	Client Sample ID	ALS Sample ID Filename	Dilution Factor Sampling date Acquisition Time	Target RL Analyte ug/sample	Chloromethane Vinyl Chloride	Bromomethane Chloroethane	1,1-Dichloroethene Iodomethane	Carbon disulfide	Chloroform	Carbon Tetrachloride	1,2-Dichloroethane	1,2-Dichlaropropane	ioluene 1,1,2-Trichloroethane	Tetrachloroethene Chlorobenzene	Ethylbenzene M&P-Xylene	Styrene	1,1,2,2-Tetrachloroethane Acrytonitrile	Field Standard	d10-Ethylbenzene	Surrogate Standards	d4-1,2-Dichloroethane d8-Toluene 4-Bromofluorobenzene	Internal Standards Bromochloromethane 1,4-Diffuorobenzene d5-Chlorobenzene

			ALS Envi	Environmental			
			Sample Analysis	Sample Analysis Summary Report			
Instrument Column Acquisition Start Date	Σασῖ	MSD-3 Rxi-624Sil MS 1360231 9/16/2016	50231		Sample Matrix Analysis Units	VOST Tube ug/sample	
Client Sample ID	-	Laboratory Method Blank	Laboratory Control Sample	C-0031-1A (TENAX TUBE#1)	C-0031-1D (TENAX TUBE#1)	C-0031-2A (TENAX TUBE#1)	Targeted Recovery Control Limtis
ALS Sample ID Filename		vost-blank 16091607.D	250ng-Controlstd 16091606.D	L1826815-1 16091608.D	L1826815-7 16091609.D	L1826815-13 16091610.D	
Dilution Factor Sampling date Acquisition Time		1 9/16/2016 15:27	1 9/16/2016 14:45	1 9/8/2016 9/16/2016 16:06	1 9/8/2016 9/16/2016 16:44	1 9/8/2016 9/16/2016 17:22	
Target Analyte ug/	RL /sample	Conc. ug/sample	% Rec	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	
Chloromethane	90.0	٧	116	<0.06	90'0>	<0.05	
Vinyl Chloride	0.02	٧	78	<0.02	<0,02	<0,02	
Bromomethane	0.09	V \	69 8	60.09 00.00	<0.09 <0.09	<0.09 <0.09	
1,1-Dichloroethene	0.01	/ V	75	<0.07	<0.07	<0.02	
Iodomethane	0.03	٧	NS	<0,03	<0.03	<0.03	
Carbon disultide Methylene Oblogide	0.02	V V	93	0.023	<0.02 <0.102	<0.02	
Chloroform	0.01	' V	67	<0.01	<0.01	<0.01	
1,1,1-Trichloroethane	0,01	V W	91	0.07	<0.01 <0.01	0.01 0.01	
Benzene	0.05	' V	06	3.24 E	2,45 E		
1,2-Dichloroethane	0.01	V V	48 48 88	<0.01 <0.01	0.01 0.01	0.01 0.01	
1,2-Dichloropropane	0.01	′ ∨	95	<0.01	<0.01	<0.01	
Toluene	0.05	٧,	74	0.738	0.622	0.434	
1,1,2-Irichloroethane Tetrachloroethene	0.02	v v	73	<0.02	<0.02	<0.02 <0.01	
Chlorobenzene	0.01	٧	79	<0.01	<0.01	<0.01	
Ethylbenzene M&P-Xvlene	0.01	v v	81	0.022	0.017	0.011	
O-Xylene	0.01	٧ ٬	78	0.058	0.047	0.029	
Styrene Bromoform	0.02	v v	72	0,083 <0.01	0,072	<0.01	
,1,2,2-Tetrachloroethane Acrylonitrile	0.02 0.05	V V	72 NS	<0.02 <0.05	<0.02 <0.05	<0.02 <0.05	
Field Standard		% Rec	% Rec	% Rec	% Rec	% Rec	
d10-Ethylbenzene		26	77	70	87	78	
Surrogate Standards		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d4-1,2-Dichloroethane d8-Toluene 4-Bromofluorobenzene		115 98 87	92 94 99	111 94 107	106 103 84	103 101 83	50-150 50-150 50-150
Internal Standards Bromochloromethane 1,4-Difluorobenzene		% Rec 113 132	% Rec 108 102	% Rec 110 125	% Rec 124 139	% Rec 128 152	% Rec 50-200 50-200
d5-Chlorobenzene		120	104	119	114	125	50-200

L1826815 VOST 160926



1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6 Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID: EQM100

ALS WO#: L1830034 Date of Report 30-Sep-16

Date of Sample Receipt 16-Sep-16

Client Name:

Environmental Quality Management Inc.

Client Address:

1800 Carillon Boulevard

Cincinnati, OH 45240

United States

Client Contact: Doug Allen

Client Project ID: AK Middletown ICR

COMMENTS:	VOCs via SW846 Method 5041A/8260B
NS	indicates that compound was not spiked
E	indicates that compound response exceeds instrument calibration range of 1.0 ug
Х	indicates that compound value is biased high due to low addition of internal standards.
L	indicates that compound response recovery is below 50%.
С	indicates a suspected contamination.

For the sample C-0031-4A (TENAX TUBE#1), there is indication that an incomplete aliquot of internal standard was added. As a result, the results are likely biased high.

For selected diluted (TENAX TUBE#2 + ANASORB 747) samples there are detected levels of methylene chloride. This is a known laboratory and field contaminant. The reported values may be elevated.

S.Kennedy 30-Sep-16

Certified by:

L1830034 VOST 160930

Whitney Davis Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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					ALS	ALS Environmental					
					Sample A.	Sample Analysis Summary Report	t				
Instrument Column Acquisition Start Date	MSD-3 Rxi-624SII 9/27/2016	MSD-3 RX-624SI MS 1360231 9/27/2016	1231		Sample Matrix Analysis Units	VOST Tube ug/sample					
	Lai Meth	Laboratory Method Biank	Laboratory C Control Sample	Laboratory C-0031-BLANK trol Sample (TENAX TUBE#1)	C-6031-4A (TENAX TUBE#1)	C-0031-4D (TENAX TUBE#1)	C-0031-4B (TENAX TUBE#1)	C-0031-4C (TENAX TUBE#1)	C-0031-4E (TENAX TUBE#1)	C-0031-4F (TENAX TUBE#1)	Recovery Control Limtis
Client Sample ID ALS Sample ID Filename Dilution	VC 160	VOST-blank 2 16092707.D	250ng-Controlstd 16092706.D	1.830034-13 16092708.D	L1830034-1 16092709,D	L1830034-7 16092710.D	L1830034-3 16092715.D 50	L1830034-5 16092716.D 50	L1830034-9 16092717.D 50	11830034-11 16092718.D	
Sampling date Acquisition Time	***	5	9/27/2016 14:02 #	9/12/2016 ##########	9/15/2016 9/27/2016 15:31	9/15/2016 9/27/2016 15:56	9/15/2016 #########	9/12/5016 ####################################	6/15/2016 ##########	9/15/2016 #########	
Target RL Analyte ug/sample		Conc. ug/sample	% Rec	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	
Chloromethane		٧	121	<0.05	<0.05	<0.05	V	Q	۵	ŋ	
Vinyl Chloride	0.02	٧	91	<0.02	<0.02	<0.02	∀'	₹'	Ծ՝	∀!	
Bromomethane	60.0	V	76	60.0> 60.0≥	60.0>	60.0>	× × ×	\$4.5 *	4.5 5.4.5		
Chloroethane 1 1-Dichloroethane	0.02	v v	7 60 50	<0.02 <0.02	<0.02	<0.02	<0°2	40°2	20,5	<0.5	
Iodomethane	0.03	· v	SS	<0.03	<0.03	<0.03	<1.5	<1.5	<1.5	<1.5	
Carbon disulfide	0.02	٧	104	<0.02	0.597 X	0.140	₽ 5	₹ 5	⊽ 5	∀ 4	
Methylene Chloride	1,0	v \	4 62	1.00 %	7.00	100	v č	C (2)	, C	, Ç	
1.1.1-Trichloroethane	0,01	/ V	06	<0.0>	<0.01	<0.02 0.01	<0.5 <0.5	<0.5	\$0.5 50.5	<0.5	
Carbon Tetrachloride	0.01	٧	56	<0.01	<0.01	<0,01	<0.5	<0.5	<0.5	<0.5	
Benzene	0.05	VI	92	V0.05	13,9 E,X	5.62 E	12.7	16.7	2.4.5 7.00	18.7	
Trichloroethene	0.01	/ V	110	×0.01	<0.01	×0.01	< 0.5	<0.5	<0.5	< O.5	
1,2-Dichloropropane	0.01	v	105	<0.01	<0.01	٧	<0.5	<0.5	<0.5	<0.5	
Toluene	0.05	۷١	80 0	80°03	6.58 E,X	2.23 E	<2.55	3,16	2,65	3,15	
Tetrachloroethene	0.01	/ V	85	<0.0>	<0,01	<0.01	<0.5	<0.5	<0.5	<0.5	
Chlorobenzene	0.01	٧	98	<0.01	<0.01		<0.5	<0'2	<0.5	<0.5	
Ethylbenzene	0.01	V	76	40.01 60.01	0,097 X		0 C	2 Q	 	0 V	
Proxylene O-Xylene	0.01	/ v	9.6	V0.07	0.433 X		<0.5	205	\$0.5 \$0.5	\$ 0.5 5.05	
Styrene	0.02	V	85	<0.02	0.670 X	0.142	₽ .	∀ €	ላ ረ	Υ	
1,1,2,2-Tetrachloroethane	0.02	/ V	78	<0.02	<0.02	<0.02	₹ ₹	₹ ₹	} ⊽ ;	} ⊽ ;	
Acrylonitrile	50.0	V	SN	<0.05	<0.05	<0.05	<2.5	<22.5	<2.5	<2.5	
Field Standard		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	
d10-Ethylbenzene		86	66	96	601 X	148	69	89	120	91	
Surrogate Standards		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d4-1,2-Dichloroethane		114	87	115	88	90	116	113	111	115	50-150
4-Bromofluorobenzene		103	115	103	06	108	95	91	56	96	50-150
Internal Standards		% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
Bromochloromethane		265	4. 2	161	14.4	88	103	96	87 98	£ 6	50-200
d5-Chlorobenzene		86	91	97	34 L	81	66	95	86	95	50-200

ALS Canada Ltd

L1830034 VOST 160930

				ALS	ALS Environmental					
				Sample /	Sample Analysis Summary Report	ort				
Instrument Column Acquisition Start Date	MSD-3 RX+624SII MS 136D231 9/28/2016	160231		Sample Matrix Analysis Units	VOST Tube ug/sample					
	Laboratory Method Blank	Con	Laboratory C-0031-BLANK rol Sample (TENAX TUBE#2 + ANASORB 747)	C-0031-4A (TENAX TUBE#2 + ANASORB 747)	C-0031-4D (TENAX TUBE#2 + ANASORB 747)	C-0031-4B (TENAX TUBE#2 + ANASORB 747)	C-0031-4E (TENAX TUBE#2 + ANASORB 747)	C-0031-4C (TENAX TUBE#2 + ANASORB 747)	C-0031-4F (TENAX TUBE#2 + ANASORB	Recovery Control Limtis
Client Sample ID ALS Sample ID Filename Dilution	VOST-blank 16092806.D	250ng-Controistd 16092805.D	L1830034-14 16092807.D	L1830034-2 16092808.D	L1830034-8 16092809.D	L1830034-4 16092811.D 10	L1830034-10 16092812.D 10	L1830034-6 16092813.D 10	L1830034-12 16092814.D	
Sampling date Acquisition Time	***	9/28/2016 13:13	9/15/2016 #########	9/15/2016 9/28/2016 14:43	9/15/2016 9/28/2016 15:22	9/15/2016	9/15/2016 #########	9/15/2016 #########	9/15/2016 #########	
Target RL Analyte ug/sample	L Conc. Imple ug/sample	% Rec	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	Conc. ug/sample	
Chloromethane 0.06		123	<0,05	>0.06	>0.06	9.0>	9'0>	<0.6	9'0>	
	25	96	<0.02	<0.02	<0.02	<0.2	<0.2	<0.2	<0.2	
Bromomethane 0.09	60	81	60.05	0.09 Cr 0√	<0.09 0.09	6.00	0.00	6°0 V	6,00	
1.1-Dichloroethene 0.01		100	<0.02	<0.02 <0.01	<0.02	<0.1	<0.1	<0.1 C0.1	<0.1	
	2	NS	<0,03	<0.03	<0.03	c,0>	<0.3	<0.3	<0.3	
Carbon disulfide 0.02		96	<0.02	0.157	0.217	<0.2	0.2 2.5	<0.2	<0.2	
Methylene Chloride U.3	~ ~	26.	10.0	100	<0.03	-0×	3.31 C	2.38 C	2:12 C	
1,1,1-Trichloroethane 0.01		53	<0.01	<0.01	<0,01	<0.1	<0.1	0.0	<0.1	
			40.01	20.07		<0.1 20.5	<0.1	< 0,1	<0.1	
Senzene U.U	2.2		<0.03	<0.01	<0.05	<0.1	<0.1	<0.1	× 0.1	
			<0.01	<0,0>	<0.01	<0.1	×0.1	<0.1	۲.0۰	
1,2-Dichloropropane 0.01			<0.01 20.01	<0,01	<0.01	A	1,0 V	0.0	000	**********
loluene c.u	2 2		<0.02	<0.02	<0.02	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	00.2	<0.2	V 05	
	1.5		<0,01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	
			<0.07	<0.01	V 0.01	0.0	1,00	0 0		
Ethylbenzene 0.01 M&P-Xylene 0.03	. v	102	<0.03	<0.03	0,032	**************************************	×0.3	, E.O.	ναν (0.3	
			<0.01 2.01	<0.01	<0.01	<0.1 2.1	<0.1	70.1	<0.1	
	~ .		<0.02	70.02 F0 F1	<0.02 <0.02	20.7 20.1	<0.7 -0.7	50.7 50.7	<0.2 2.0.2	
Bromororm 1,1,2,2-Tetrachloroethane 0.02 AcrylonItrile 0.05		77 78 88	< 0.02 < 0.05 < 0.05	<0.02 <0.02 <0.05	40.02 40.05 60.05	0.5 0.5 0.5	× 0.2	00 V 00 2 2 00 2 3	< 0.5 < 0.5 < 0.5	
	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	
d10-Ethylbenzene	104		NS	NS	SN	SN	SN	SN	SN	
Surrogate Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
d4-1,2-Dichloroethane d8-Toluene 4-Bromofliomphanzene	103 99 90	80 96	105 99 44	97 100 95	97 102 92	109 101 93	109 99 91	110 101 93	110 98 90	50-150 50-150 50-150
	3	ì		2 2					200	70 70
Internal Standards Bromochloromethane 1,4-Diffuorobenzene	% Rec 120 130	% Rec 108 93	% Rec 99 107	20 106 105	% Kec 110 112	% Kec 104 105	% Kec 105 103	% Kec 105 105	70 Kec 103 104	50-200 50-200 50-200
d5-Chlorobenzene	124		16	77	Ino	40	44	07	n.	nn7-nc





1435 Norjohn Court, Unit 1, Burlington ON, L7L 0E6 Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact: Whitney Davis

ALS Project ID: EQM100

ALS WO#: L1827080

Date of Report 23-Sep-16 Date of Sample Receipt 9-Sep-16

Client Name:

Environmental Quality Management Inc.

Client Address:

1800 Carillon Boulevard

Cincinnati, Oh 45240

(513) 825-7500

Client Contact: Doug Allen

Client Project ID: 50074.0172 AK STEEL ICR

COMMENTS:

CI as HCI Anion Analysed via Ion Chromatography Method USEPA 26 (FE 20-Sep-2016) F as HF Anion Analysed via Ion Chromatography Method USEPA 26 (FE 20-Sep-2016)

LOR = Limit of Reporting

LCB = Laboratory Control Blank (limits: <LOR)

LCS = Laboratory Control Sample (limits: 90-110%)

MS = Matrix Spike Sample (limits: 90-110%, NH₃: 85-115%)

RPD = Relative Percent Difference (limits: <20% for sample duplicate, <10% for duplicate injection)

CVS = Calibration Verification Standard (limits: 90-110%)

Certified by:

Whitney Davis Account Manager

Results in this certificate relate only to the samples as submitted to the laboratory.

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L1827080 HCI HF 160923 ALS Canada Ltd Page 1 of 5

Sample Analysis Summary Report

		<u> </u>		*****	
Sample Name	P-26-1	P-26-2	P-26-3	P-26-4	C-26-
·	L1827080-1	L1827080-2	L1827080-3	L1827080-4	L1827080-
ALS Sample ID	L 1627000-1 Stack	Stack	Stack	Stack	Stac
Matrix	Sample	Sample	Sample	Sample	Sampl
Analysis type	23-Aug-16	23-Aug-16	24-Aug-16	24-Aug-16	6-Sep-16
Sampling Date/Time	•	-	9-Sep-16	9-Sep-16	9-Sep-16
Date of Receipt	9-Sep-16	9-Sep-16	a-3eh-10	9-3ep-10	a-geb-10
lon Chromatography Analysis					
Method 26A	mg	mg	mg	mg	mg
Total F [*] as HF (ave)	<0.107	<0.119	<0.117	<0.116	0.329
Analysis 1	<0,107	<0.119	<0.117	<0.116	0.331
Analysis 2	<0.107	<0.119	<0.117	<0.116	0.327
Total Cl' as HCl (ave)	0.408	0.440	0.334	0.379	11.6
Analysis 1	0.407	0.446	0.342	0.389	11.6
		0.434	0,325	0.370	11,5

Sample Analysis Summary Report

Sample Name	C-26-2	C-26-3	0.1N H2SO4 BLANK	H2O BLANK
ALS Sample ID	L1827080-6	L1827080-7	L1827080-8	L1827080-9
Matrix	Stack	Stack	Stack	Stack
Analysis type	Sample	Sample	Sample	Sample
Sampling Date/Time	8-Sep-16	8-Sep-16	8-Sep-16	8-Sep-16
Date of Receipt	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16
Ion Chromatography Analysis				
Method 26A	mg	mg	mg	mg
Total F ⁻ as HF (ave)	0,313	0,305	<0.0754	<0.0403
Analysis 1	0.311	0.305	<0.0754	<0.0403
Analysis 2	0.315	0,306	<0.0754	<0,0403
Total CF as HCI (ave)	6.87	9.21	0.144	<0.0710
Analysis 1	6.88	9.22	0.142	<0.0710
Analysis 2	6.86	9,20	0.146	< 0.0710

Sample QC Summary Report

		•		
Sample Name	LCB	LCS	LCS	
ALS Sample ID	LCB	LCS	LCS	
Matrix	Stack	Stack	Stack	
Analysis type	Method Blank	Blank Spike	Blank Spike	
Sampling Date/Time	n/a	n/a	n/a	
Date of Receipt	n/a	п/а	n/a	
ion Chromatography Analysis				
Method 26A	mg	mg	% Rec	
Total F as HF (ave)	<0.0175	0.517	97%	
rotail as ili (ave)	~U,U,U	0.511	3170	
Analysis 1	<0.0175	0,514		
Analysis 2	<0.0175	0.519		
	<0.0175	0.010		
Tetal OF an HOL(aug)			059/	
Total Cl as HCl (ave)	<0.0309	0.756	95%	
Totał СГ as HCI (ave) Analysis 1			95%	

Sample QC Summary Report

Sample Name	P-26-1	P-26-1	P-26-1	P-26-1
ALS Sample ID	L1827080-1	L1827080-1DUP	L1827080-1MS	L1827080-1MS
Matrix	Stack	Stack	Stack	Stack
Analysis type	Sample	Duplicate	Matrix Splke	Matrix Spike
Sampling Date/Time	23-Aug-16	23-Aug-16	23-Aug-16	23-Aug-16
Date of Receipt	9-Sep-16	9-Sep-16	9-Sep-16	9-Sep-16
Ion Chromatography Analysis				
Method 26A	mg	mg	mg	% Rec
Total F as HF (ave)	<0.107	<0.107	3.21	99%
Analysis 1	<0.107	<0.107	3.21	
Analysis 2	<0.107	<0.107	3.20	
Total Ci ⁻ as HCi (ave)	0.408	0,405	4.98	97%
Analysis 1	0.407	0.413	4.98	
Analysis 2	0.410	0.398	4.98	





Attention:Whitney Davis

ALS Environmental 1435 Norjohn Court Unit 1 Burlington, ON CANADA L7L 0E6

Report Date: 2016/10/07

Report #: R4194197 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6J5237 Received: 2016/09/13, 12:22

Sample Matrix: Stack Sampling Train

Samples Received: 20

	Date	Date			
Analyses	Quantity Extracted	Analyzed	Laboratory Method	Reference	
Hydrogen Cyanide Emissions (OTM29)	20 2016/09/2	1 2016/09/21	. CAM SOP-00466	EPA OTM-29 m	
Volume of Sodium Hydroxide Impinger	20 N/A	2016/10/02	!		

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Clayton Johnson, Project Manager - Air Toxics, Source Evaluation

Email: CJohnson@maxxam.ca Phone# (905)817-5769

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

^{*} RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



ALS Environmental

EPA OTM 029 HYDROGEN CYANIDE (STACK SAMPLING TRAIN)

Maxxam ID		DBC972	8	DBC975	DBC976			
Sampling Date		2016/09/08		2016/09/08	2016/08/25			
	UNITS	HCN BLANK- 0.1N NAOH	RDL	HCN BLANK- 6N NAOH	P- HCN- FB- IMP1&2	RDL	QC Batch	MDL
Sodium Hydroxide Volume	ml	100	1	195	225	1	4670480	1
Inorganics								
Hydrogen Cyanide	ug	<20	20	<100	<100	100	4670469	3
RDL = Reportable Detection QC Batch = Quality Control E								

Maxxam ID		DBC977		DBC978		DBC979			
Sampling Date		2016/08/25		2016/09/08		2016/09/08			
	UNITS	P- HCN- FB- IMP3	RDL	C- HCN- FB- IMP1&2	RDL	C- HCN- FB- IMP3	RDL	QC Batch	MDL
Sodium Hydroxide Volume	ml	120	11	250	1	95	1	4670480	1
Inorganics									
Hydrogen Cyanide	ug	<60	60	<100	100	<50	50	4670469	3
RDL = Reportable Detection QC Batch = Quality Control E			-						•

Maxxam ID		DBC980		DBC981		DBC982		DBC983			
Sampling Date		2016/08/23		2016/08/23		2016/08/23		2016/08/23			
	UNITS	P- HCN- 1- IMP1&2	RDL	P- HCN- 1- IMP3	RDL	P- HCN- 2- IMP1&2	RDL	P- HCN- 2- IMP3	RDL	QC Batch	MDL
Sodium Hydroxide Volume	ml	205	1	112	1	222	1	115	1	4670480	1
Inorganics											
Hydrogen Cyanide	ug	180	100	<60	60	160	100	<60	60	4670469	3
RDL = Reportable Detection QC Batch = Quality Control E											

Maxxam ID		DBC984		DBC985		DBC986		DBC987			
Sampling Date		2016/08/24		2016/08/24		2016/08/25		2016/08/25			
	UNITS	P- HCN- 3- IMP1&2	RDL	P- HCN- 3- IMP3	RDL	P- HCN- 4- IMP1&2	RDL	P- HCN- 4- IMP3	RDL	QC Batch	MDL
Sodium Hydroxide Volume	ml	245	1	105	1	242	1	120	1	4670480	1
Inorganics											
Hydrogen Cyanide	ug	110	100	<50	50	150	100	<60	60	4670470	3

RDL = Reportable Detection Limit QC Batch = Quality Control Batch



ALS Environmental

EPA OTM 029 HYDROGEN CYANIDE (STACK SAMPLING TRAIN)

Maxxam ID		DBC988		DBC989		DBC990		DBC991			
Sampling Date		2016/09/06		2016/09/06		2016/09/08		2016/09/08			
	UNITS	C- HCN- 1- IMP1&2	RDL	C- HCN- 1- IMP3	RDL	C- HCN- 2- IMP1&2	RDL	C- HCN- 2- IMP3	RDL	QC Batch	MDL
			24 14		76 909						
Sodium Hydroxide Volume	ml	287	1	130	1	310	1	117	1	4670480	1
Inorganics							- 25				
Hydrogen Cyanide	ug	390	100	<70	70	390	200	<60	60	4670470	3
RDL = Reportable Detection	Limit										
QC Batch = Quality Control B	atch										

Maxxam ID		DBC992		DBC993			
Sampling Date		2016/09/08		2016/09/08			
	UNITS	C- HCN- 3- IMP1&2	RDL	C- HCN- 3- IMP3	RDL	QC Batch	MDL
	- /8						
Sodium Hydroxide Volume	ml	310	1	125	1	4670480	1
Inorganics							
Hydrogen Cyanide	ug	530	200	<60	60	4670470	3
RDL = Reportable Detection	Limit				78		
100	Batch						



ALS Environmental

TEST SUMMARY

Maxxam ID: DBC972

Sample ID: HCN BLANK- 0.1N NAOH

Stack Sampling Train Matrix:

2016/09/08 Collected:

Shipped: Received:

Collected:

Collected:

2016/09/13

2016/09/08

2016/08/25

Test Description Date Analyzed Instrumentation Batch Extracted Analyst Hydrogen Cyanide Emissions (OTM29) 4670469 2016/09/21 IC/SPEC 2016/09/21 Lang Le Volume of Sodium Hydroxide Impinger 4670480 2016/10/02 N/A Frank Mo

Maxxam ID: DBC975

Sample ID: HCN BLANK- 6N NAOH Matrix: Stack Sampling Train

Shipped:

Received: 2016/09/13

Test Description Extracted Date Analyzed Analyst Instrumentation Batch 2016/09/21 Hydrogen Cyanide Emissions (OTM29) IC/SPEC 4670469 2016/09/21 Lang Le Volume of Sodium Hydroxide Impinger 4670480 N/A 2016/10/02 Frank Mo

DBC976 Maxxam ID:

Sample ID: P-HCN-FB-IMP1&2

Shipped: 2016/09/13 Matrix: Stack Sampling Train Received:

Test Description Instrumentation Extracted **Date Analyzed** Batch Analyst

Hydrogen Cyanide Emissions (OTM29) IC/SPEC 4670469 2016/09/21 2016/09/21 Lang Le Volume of Sodium Hydroxide Impinger 4670480 N/A 2016/10/02 Frank Mo

Maxxam ID: DBC977

Sample ID: P- HCN- FB- IMP3

Matrix: Stack Sampling Train Collected: 2016/08/25

Shipped:

2016/09/13 Received:

Test Description Instrumentation Batch Extracted Date Analyzed Analyst Hydrogen Cyanide Emissions (OTM29) IC/SPEC 4670469 2016/09/21 2016/09/21 Lang Le 4670480 2016/10/02 Volume of Sodium Hydroxide Impinger N/A Frank Mo

Maxxam ID:

DBC978

C- HCN- FB- IMP1&2 Sample ID:

> Matrix: Stack Sampling Train

Collected: 2016/09/08

Shipped:

Received: 2016/09/13

2016/09/08

Test Description Instrumentation Batch Extracted **Date Analyzed** Analyst Hydrogen Cyanide Emissions (OTM29) IC/SPEC 4670469 2016/09/21 2016/09/21 Lang Le Volume of Sodium Hydroxide Impinger 4670480 2016/10/02 Frank Mo N/A

Maxxam ID: DBC979

Sample ID:

Collected:

C- HCN- FB- IMP3 Shipped: Matrix: Stack Sampling Train

2016/09/13 Received:

Test Description Instrumentation Extracted Date Analyzed Batch Analyst Hydrogen Cyanide Emissions (OTM29) IC/SPEC 4670469 2016/09/21 2016/09/21 Lang Le 4670480 Volume of Sodium Hydroxide Impinger N/A 2016/10/02 Frank Mo



ALS Environmental

TEST SUMMARY

Maxxam ID: DBC980

Sample ID: P- HCN- 1- IMP1&2

Matrix: Stack Sampling Train

Collected: 2016/08/23

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670469	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC980 Dup

Sample ID: P- HCN- 1- IMP1&2

Matrix: Stack Sampling Train

Collected: Shipped:

2016/08/23

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670469	2016/09/21	2016/09/21	Lang Le

Maxxam ID: DBC981

Sample ID: P- HCN- 1- IMP3 Matrix: Stack Sampling Train

Collected: 2016/08/23

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670469	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC982

Sample ID: P- HCN- 2- IMP1&2 Matrix: Stack Sampling Train

Collected: 2016/08/23

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670469	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC983

Sample ID: P- HCN- 2- IMP3

Matrix: Stack Sampling Train

Collected: 2016/08/23

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670469	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID:

DBC984

P- HCN- 3- IMP1&2 Sample ID:

Matrix: Stack Sampling Train

Collected: 2016/08/24

Shipped: Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo



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TEST SUMMARY

Maxxam ID: DBC985

Sample ID: P- HCN- 3- IMP3

Matrix: Stack Sampling Train

Collected: 2016/08/24

Shipped:

2016/09/13 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC986

Sample ID: P- HCN- 4- IMP1&2

Matrix: Stack Sampling Train

Collected: 2016/08/25

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC986 Dup

Sample ID: P- HCN- 4- IMP1&2 Matrix: Stack Sampling Train Collected:

2016/08/25

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le

Maxxam ID: DBC987

P- HCN- 4- IMP3 Sample ID:

Matrix: Stack Sampling Train

Collected: 2016/08/25

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC988

Sample ID: C- HCN- 1- IMP1&2

Matrix: Stack Sampling Train

Collected: 2016/09/06

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC989

C- HCN- 1- IMP3 Sample ID:

Matrix: Stack Sampling Train

Collected: 2016/09/06

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo



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TEST SUMMARY

Maxxam ID: DBC990

Sample ID: C- HCN- 2- IMP1&2

Matrix: Stack Sampling Train

Collected: 2016/09/08

Shipped:

2016/09/13 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC991

Matrix: Stack Sampling Train

Sample ID: C- HCN- 2- IMP3

Collected:

2016/09/08

Shipped:

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo

Maxxam ID: DBC992

Sample ID: C- HCN- 3- IMP1&2

Matrix: Stack Sampling Train

Collected: Shipped:

2016/09/08

2016/09/13 Received:

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst		
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le		
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo		

Maxxam ID: DBC993

Sample ID: C- HCN- 3- IMP3

Matrix: Stack Sampling Train

Collected: Shipped:

2016/09/08

Received: 2016/09/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst		
Hydrogen Cyanide Emissions (OTM29)	IC/SPEC	4670470	2016/09/21	2016/09/21	Lang Le		
Volume of Sodium Hydroxide Impinger		4670480	N/A	2016/10/02	Frank Mo		



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GENERAL COMMENTS

EPA OTM 029 HYDROGEN CYANIDE (STACK SAMPLING TRAIN)

Hydrogen Cyanide Emissions (OTM29): Some samples were analyzed past hold-time. The samples were re-analyzed and confirmed on different days.

Results relate only to the items tested.



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QUALITY ASSURANCE REPORT

QA/QC				Date		%		
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4670469	LLE	Matrix Spike(DBC980)	Hydrogen Cyanide	2016/09/21		116	%	N/A
4670469	LLE	Spiked Blank	Hydrogen Cyanide	2016/09/21		105	%	90 - 110
4670469	LLE	Method Blank	Hydrogen Cyanide	2016/09/21	<30		ug	
4670469	LLE	RPD - Sample/Sample Dup	Hydrogen Cyanide	2016/09/21	NC		%	20
4670470	LLE	Matrix Spike(DBC986)	Hydrogen Cyanide	2016/09/21		111	%	N/A
4670470	LLE	Spiked Blank	Hydrogen Cyanide	2016/09/21		99	%	90 - 110
4670470	LLE	Method Blank	Hydrogen Cyanide	2016/09/21	<20		ug	
4670470	LLE	RPD - Sample/Sample Dup	Hydrogen Cyanide	2016/09/21	NC		%	20

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).



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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Frank Mo, B.Sc., Inorganic Lab. Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.